REMOTE IMAGING GROUP

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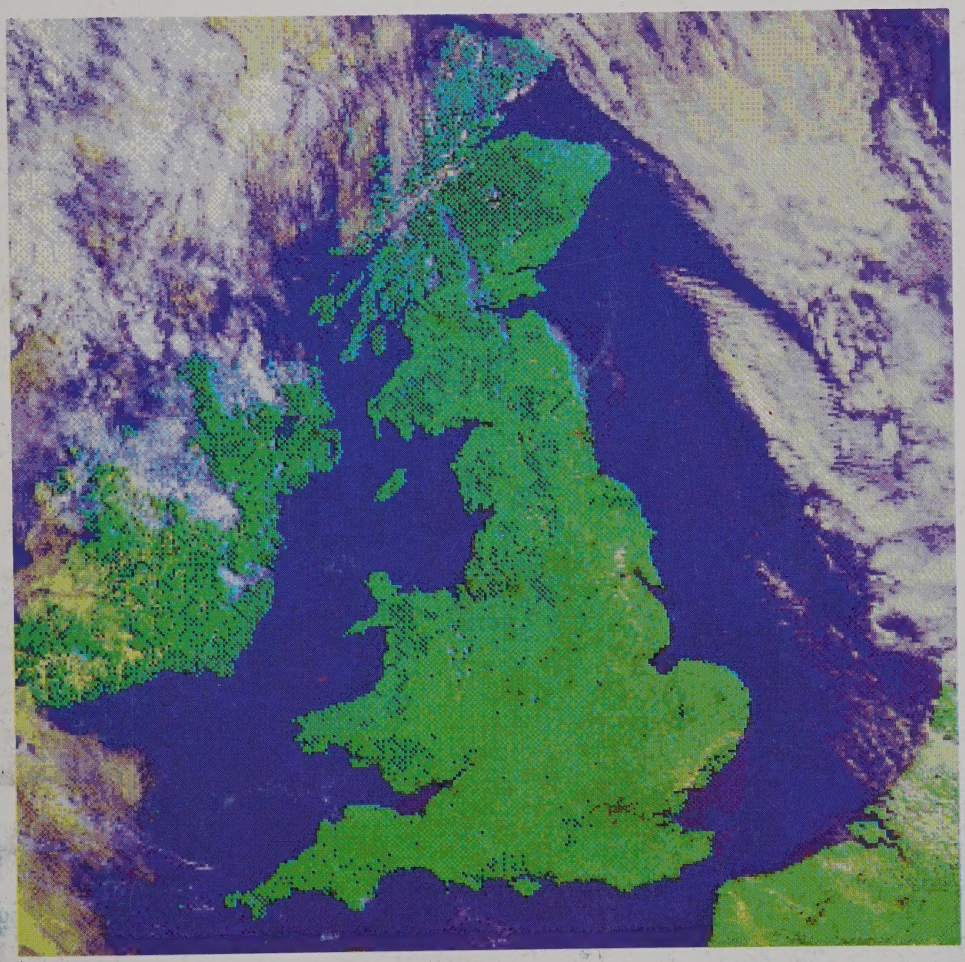

JOURNAL NO.35

DECEMBER 1993

REMOTE IMAGING GROUP JOURNAL No.35

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CONTENTS

OFFICERS 1993		2
CHAIRMAN'S WAFFLE	Henry Neale	3
FROM THE TREASURER	Mark Clarke	6
FROM THE SECRETARY	John Tellick	7
1993 MEMBERSHIP SURVEY	Ray Godden	9
DISH UP THIS IDEA	Geoff Brown	13
FROM CROP CIRCLES TO CLOUD CIRCLES	David Watson	15
THE YEAR IN SPACE	Circuit Breaker	19
RIG COMPETITION - RESULTS		23
THE GLOBAL POSITIONING SATELLITES (GPS)	Alan Jarvis	24
INTERPRETING WX SAT IMAGERY - PART 6	Peter Wakelin	25
RIG CONFERENCE 94	Sam Taylor	30
JVFAX V.6.0 - THE FINAL VERSION?	Mark Pepper	31
METEOSAT NO.3 ALIVE?	James Brown	32
METEOSAT AND SOLAR INTERFERENCE	Peter Wakelin	34
A LOW COST 137 MHz RECEIVER	Ray Godden	36
DIY PICTURE RECEPTION - A QUICK GUIDE	Mark Pepper	40
METEOSAT VIA 46 MHz	Barry Haines	47
THE RIG GIF LIBRARY	Peter Wakelin	50
SHAREWARE CORNER	Les Hamilton	51
THE ARCHIMEDES PICTURE LIBRARY	Les Hamilton	55
THE SOVIET AND CHINESE SCENE	Peter Wakelin	57
KEPLER ELEMENTS	Simon Goodall	59
MEMBER'S LETTERS		60
RIG AT RALLIES		65
RIG HELPLINES		66
RIG SHOP CORNER		68
ADVERTISEMENTS		70
NOAA PREDICTIONS	Simon Goodall	Centre

Front Cover: NOAA11 HRPT Multi-spec. image of UK, 27 June 93, by Trevor Smithers.

Inside Front Cover: NOAA HRPT image by Peter Wakelin of part of the West Mediterranian Sea, 9 July 93 at 1500. Raw channel 4 image showed the hot land almost black and sea and clouds as a much cooler pale grey. By "contrast stretching" the greys in the sea, the eddies and currents became apparent due to temp variations. Image was processed via Multispectral View II, and although only a single data channel was used, colour enabled the full range of tones from very pale blue (cool) to almost black (warm) to be allocated to the sea. In monochrome a similar contrast expansion would have rendered the warm water coasts of Corsica and Sardinia invisible.

Inside Back Cover: NOAA11 HRPT Multi-spec. image, 27 June 93 showing cities in red, Trevor Smithers.

Outside Back Cover: NOAA11 HRPT Muti-spec. image of Spain & Gibraltar, 13 July 93, Trevor Smithers.

REMOTE IMAGING GROUP.....OFFICERS 1993

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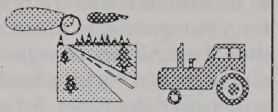
CHAIRMAN'S WAFFLE

HENRY NEALE



As 1993 draws to a close and all those projects and ideas that were instigated and initiated only a few of which matured. If you are like me, many more never even left the drawing board, it will soon be too late to hit the high times in 1993! We all have high ideals but only a few seem to acheive those lofty heights. I have had my share of projects and like most people have not managed to even get started on some of them. I have started to gather together raw materials for a " Quad Loop Yagi revisited" project with several interesting ideas to try out, but alas other things have prevented me. A ready made Low Noise Amplifier that might be available in 1994 - it certainly wont manage it in 1993! There are plans afoot for a high performance Downconvertor but alas it didn't make it in 93! Some of the work that I have been doing has been allocated out to others that have a bit more time on their hands and that should help me in future. It will not affect the present ordering system it just means that the postmark will not be from here on certain items. Eventually I might get around to the Grand Office clear up! - you never know!

It is no good wailing over lost opportunities but I must make more efficient use of the limited time available. Turnover hasn't increased this year and has reduced marginally. This was to a certain amount intentional. We only have 24 hours in a day and earning a crust does have to come first some times! We did manage to have the RIG Conference in 1993 and those of you that attended will no doubt ensure that when the next one is arranged the date will be etched in you diarys. When I started out on the Friday to go to the first RIG Week-end I was very apprehensive - not knowing exactly how it was going to go. At the end there was absolutely no doubt in my mind that there would be another! Where, when, how etc have yet to be decided but there will be another!

As we roll around to Xmas and all the periferal activities associated therewith, I might be able to sneak a few extra hours on some of those nearly lost projects and who knows - there might be just a little time to actually receive an odd image or two from the polar orbiters. I am told that they arent going encripted for a long time. The trouble is that people will flog anything these days. It doesnt matter if its theirs to flog - but if it means that there is a few more ECU's in the slush fund it will come in handy for someones golden handshake one day! The trouble is that some organisations think that they can do whatever they like, and then charge you for it! If we are not careful there will be a Eumetsat bill every month for XXXX ECUs for the last months *** mm of rainfall that they so kindly arranged, and whats more if any of it is allowed to evaporate you will get charged treble for ungratefully wasting it! Perhaps we should charge them for the right to take images of it in the first place! ALL WEATHER IMAGES SHOULD BE, AND REMAIN FREE! The interpretation and personal skills of the forecasters are the expensive part. The images themselves will never make a forecast, they can only be called a Nowcast! Forecasting requires the use of the likes of Crays to get to the longer term whereas seaweed is only OK for tommorrow. Sometimes large organisations get inflated impressions of their worth . If you are the only one in your field providing a service, then you might be able to charge extortionate prices. It is funny how the presure of the market place affects prices, especially when there are several more in the market selling. Everybody nowadays has

to be efficient but charging high prices often means that there aren't many customers for your goods. It must be nice to be paid by the European taxpayer to do a job, and then be able to charge that same taxpayer a second time for the data that he has already paid for! It should be very profitable. It is the ones that can least afford it that will suffer the most. Schools have just had Weather Satellites added to the curriculum and scarse resources have to go a long way. Yes PDUS is not a cheap system in the first place, but by utilising it fully, is the only way to get value for money. Yet they can look foreward to having to pay something like £400 for the key with anything up to £3000 for the digital decryption unit, unless this can be done in software. Remember that this has to be inserted in a system that probably cost less than £1000 to set up in the first place! We can understand that the commercial value of this data can be considerable, but it looks as if everybody taking data - even for non comercial purposes will be penalised. I dont think that anybody already taking PDUS data would object to paying say £100 as a one off payment for a Key to the decription unit but it is the cost of the other equipment that is almost prohibative. If our PDUS users cooperated and willingly accepted this -then Eumetsat could then switch off or on whoever they wished - as long as it wasnt us!

Earlier this year I mentioned that we visited the Isle of Man. At the airport check-in that I was extremely interested in the hand bagage checking system. It was obviously an X ray type of system but the amount of detail that it showed was amazing. In the corner of one of our bags were my telephoto lenses etc. The system actually revealed the individual elements of the lenses through the aluminium shell. I did not think it was possible to show such detail, but now I know different. Very little is not revealed!

I must be getting "Known". We had a short weekend break at Scarborough. At a convienient time I unexpectedly visit the local member who had a shop. He had no prior warning of my approach but imeadiately upon entering "Hello Henry" sort of messed the surprise element up. I shall have to go in disguise in future! On second thoughts - a second Jeremy Beadle is not called for!

The EBB has been very busy during these last few weeks. It has just knotched up its 3000th caller! I am certain that recently there has been a lot of non members logging on. They have all been authorised so far, but whether they continue to be, will have to be reviewed in the future. We do not want to restrict the board to members only but if the level goes below 50% we might have to reconsider the position in the future. It did have a major crash about the begining of September and most of the individual EBB user directories suffered from cross linked files. This was sorted by David Juett but when data is lost there is only one way to restore the system and that is the hard / manual way - as long as you have all the files backed up. You did back them up didnt you? - well most of them but I couldnt remember everything that was on there in the first place! Most of it was quickly restored but I shall have more time this winter to complete the job. Who said runing a Bulletin Board was easy?

With the mention of Winter, just in case we do really get a hard one this year, dont forget the animals and birds that dont snuggle up at night in a nice warm bed. At times during hard frosts and snow you know where to go to get a small tit-bit. They arent able to do that and just a few scraps could be the difference of getting through to the spring in 1994 or not quite making it. I know that you dont want to encourage vermin but there are ways to save those that need it. There could be a lot of happy faces out there in the Spring.

Now the bad news - Membership has had to be increased by the extortionate sum of £1 bringing it to £10 for UK members, and a similar increase for those of you elsewhere. We have now become a colour Journal and recently advanced to glossy paper. It all costs a little more and with a little added for inflation we finished up at £10. That finishes me off for the 1993 Waffles and that applies to you as well, as far as RIG is concerned, if you don't renew (UNLESS it says different on the address label). There is only one way (as I know to my cost!) and that is to do it straight away. We make it easy for you with the renewal form in the middle. Now that there are nearly 1700 of you I hope that box 142 at Rickmansworth is large enough and that Ray can cope with them all.
All the Best for Christmas and the New Year, Henry.

The future deadlines are as follows...

Cover date of Issue	*Deadline for Copy*
MARCH 1994	25TH JANUARY 1994
JUNE 1994	25TH APRIL 1994
SEPTEMBER 1994	25TH JULY 1994
DECEMBER 1994	25TH OCTOBER 1994

Advertisers copy will be required 7 days earlier than the deadline date, and should be sent direct to Mark Clarke. Late ads will not be included. These dates will be rigidly adhered to and there will be NO exceptions.

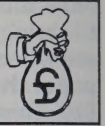
STOP PRESS...
UNFORTUNATELY, OWING TO THE RESIGNATION OF THE EDITOR AND MAKE-UP EDITOR, PLEASE FORWARD ALL COPY, READERS' LETTERS, ETC. TO THE CHAIRMAN, HENRY NEALE.

PLEASE NOTE: THAT FROM 1st DECEMBER 1993 THE RIG GIF LIBRARY WILL BE RUN BY PETER WAKELIN, UNDER A DIFFERENT SYSTEM - SEE PAGE 50 FOR DETAILS...

THE EDITOR AND MAKE-UP EDITOR ON THEIR DEPARTURE WISH YOU A VERY MERRY CHRISTMAS AND A PROSPEROUS NEW YEAR

FROM THE TREASURER

MARK CLARKE



At a recent meeting of the committee the finances of the group were reviewed. Increased costs in printing and distribution of the Journal together with other associated costs in running the group have meant that we have had to increase the subscription rate for 1994 to a basic cost of £10 for members in the UK. Other countries are increased proportionately. These increases are itemised in the enclosed membership renewal form.

PACKET - "RIG WXSAT BULLETIN"

Apologies to my avid packet friends who have been reading my weekly bulletins sent out usually on a Sunday. For the past two months no reports have been issued owing to major problems with the hard disk on my computer and associated software corruption. These problems have now been overcome and the service was resumed on Sun 31st October. Would any member who has sent me a message during September / October period and received no reply, kindly re-send their message. Please note I am now using a new BBS known as GB7SFK. My system is a Baycom modem and software, using a FT 290R MK1.

WXSAT STATION PROFILE

As a RIG representative at Rallies I thought it be useful to give my station profile as it is a frequently asked question by many members just starting out in the hobby.

Antenna - Lindenblad (Homemade)- located in house loft 8m from receiver
- Crossed Dipole (Timestep) - located on 11m tower 25m from receiver
- 1m RIG dish and RIG feedhorn (located 15m from receiver)
- 1.6m dish and RIG feedhorn (located 65m from receiver)

Downconvertor - Dartcom (located 1m from feedhorn)
Preamp - VHF (Dartcom) located at antenna
Receiver - VHF LED version (Dartcom)
- VHF (maplin)

Framestore & Monitor - YU3MV (homemade)
Software - Prosat II / PCsat III
Computer - AT 386SX40mhz 1mb RAM 40MB hard disk (runs PROsat II)
- XT 8088 10mhz 640kb 20 mb hardisk (runs PCsatIII)

Cabling - UR67 "N" type plugs

Mark G3CQL

FROM THE SECRETARY

JOHN TELLICK

METEOSAT UPDATE - AS OF 25.10.93

By the time you read this we should have, all going well, a new METEOSAT spacecraft in orbit - METEOSAT 6. This is due for launch from Kourou around 01.30UT on November 20th. The reported 'storing' of Meteosat in orbit as detailed in RIG33 will not now take place, and after a period of commissioning during December and January at around 6°W, the satellite will be drifted to 0°W. Here it will take over from METEOSAT 4 during February '94 as the operational satellite at this location.

METEOSAT 3 remains the operational at 75°W and considering its age is doing well.

METEOSAT 4 has been drifted to about 1°E and is coming up to maximum 'fishes' problem on imaging - sections of lines with erroneous grey levels on all spectral channels due to a failure in the synchronisation and power supply of its imaging converters, assumed to be caused by seasonal temperature changes affecting the operation of these converters. During this time METEOSAT 5 will take over as the operational satellite and is now positioned at 0°W. It will also take over imaging missions during the Jan/Feb 'fishes' problem.

METEOSAT 5 (if all goes well with METEOSAT 6) will be drifted around February 1994 to 75°W where it will take over from METEOSAT 3 as the X-ADC (Extended Atlantic Data Coverage) operational satellite. METEOSAT 3 will then be drifted to 50°W, it will be parked and the imaging switched off.

So the next 5 months are going to be pretty busy for EUMETSAT!

Interference to METEOSAT 4 signals by METEOSAT 5.

Owing to the number of complaints I've had this year; a note about the problem. You will have read, I hope, the notices about antenna aperture and METEOSAT 5 operations on the ADMIN. boards transmitted 8 times a day. Please do try to catch them regularly, as they are there for the users' benefit.

We all know of course that with the advances in 'front ends' - higher gain and lower noise - we are now able to obtain noise-free SDUS images from METEOSAT with 1m dishes and our Dartcom Downconverter. Yes, even Henry's loop yagi puts in a good signal level.

Alas, smaller aperture antennae equal wider beamwidths and therefore a satellite placed some 4° - 5° from the operational satellite will, if transmitting on the same frequency, be receivable albeit at a much reduced level.

I don't imagine it was ever foreseen to have two satellites transmitting at the same time quite so close. But the 'stand-by' must be checked every now and again. Unfortunately METEOSAT 4 should be the stand-by for METEOSAT 5, but that was not to be, and EUMETSAT ESOC have required considerable time running METEOSAT 5 Channel 1 this year for tests, and our gains in performance became a drawback for a time.

For those interested the Meteosat Specification, the March 1990 release reads...

"Typical SDUS Characteristics:

The system specification, used for the design of the Meteosat satellite, requires a G/T of 2.5 dB/K for the SDUS. Depending on the location, however, a relaxation of this requirement is possible. The SDUS front-end characteristics as provided in Table 3 are typical.

(Table 3 - Typical specifications for an SDUS front end.)

G/T (system specification)	< 2.5 dB/K
Low noise Preaplifier gain	30 - 40 dB
Antenna gain	25 - 27 dB
Polarisation	linear, adjustable over 180 deg.
Front end bandwidth	c. 6 MHz
Front end centre frequency	1693 MHz

The required antenna gain can be provided by parabolic reflectors of 1.50m or 5' (25 dBi) and 1.8m or 6' (27 dBi). Use of better low noise preamplifiers will lead to a reduction in size. However, a higher directive antenna provides better protection against man-made noise and interferences from nearby spacecraft (situations may arise where simultaneous transmissions could be made from two Meteosat spacecraft separated by only 8° longitude). Since antennae of these dimensions are relatively cheap, selection of a 2m reflector will be suitable for most urban environments.

The beam width of the antenna will be about 5°. Therefore no provisions are required for frequent readjustment of the pointing distortion; a semi-fixed installation will be adequate. Where the situation is appreciably worse, a more stringent specification may be required."

MEMBERSHIP REPORT - 1993
Ray Godden

As of October 20th: TOTAL RIG MEMBERSHIP = 1674

This represents a very substantial increase, bearing in mind that at this time last year the number was 1223. Over the last two years membership has increased by about 56%. No doubt the fact that we are running a modest advertising campaign has had an effect but, to quote Henry, "We must be doing something right"!

Analysing the figures:-

Renewing members ..... 1108 (66%) (85% of '92)
New Members 1993 ..... 566 (34%)
1992 members not renewing ..... 195 (15% of 1992)

The renewal rate is slightly better than last year but this year's big increase means that a significant proportion of our membership is new to RIG and this will increase by the year-end.

Radio-amateur members 999 (60%)
Overseas members 277 (17%)

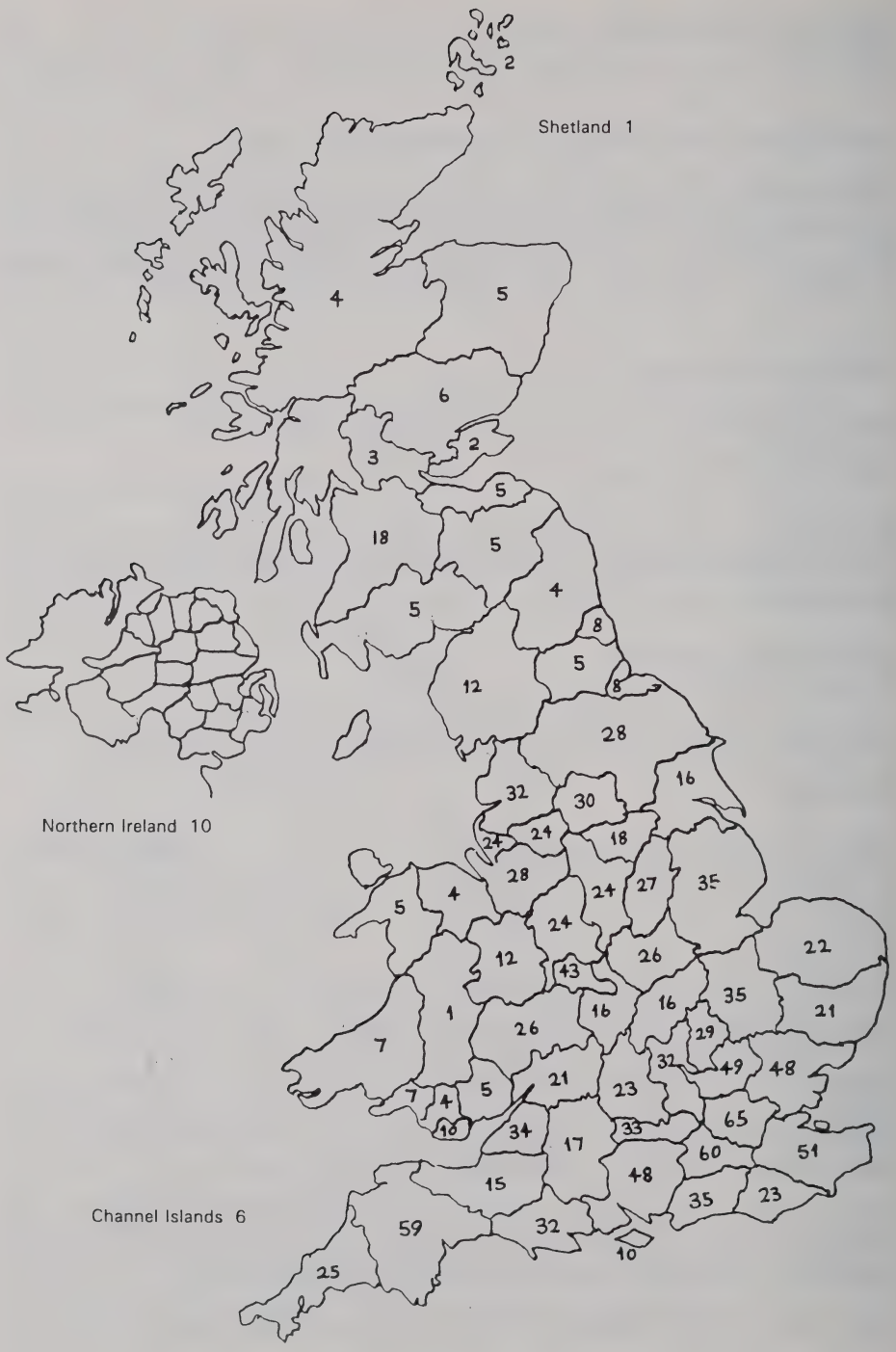
Compared to 1992 the number of overseas members has more than doubled.

By country:-

USA	47	Norway	5	Falkland Isles	1
Holland	41	West Indies	4	Greece	1
Sweden	32	Malta	3	Japan	1
Eire	19	South Africa	3	Luxembourg	1
Australia	18	Switzerland	3	Mauritius	1
Germany	16	Finland	2	Muscat	1
Italy	16	Oman	2	Portugal	1
New Zealand	11	United Arab Emirates	2	Russia	1
Belgium	10	Zimbabwe	2	Samoa	1
Canada	7	Argentina	1	Saudi Arabia	1
France	7	Austria	1	Sri Lanka	1
Spain	7	Ethiopia	1		

The United States has moved to the top of the list, largely due to Dave Cawley's efforts at the Dayton Hamfest. Many other countries also have substantially increased membership. The number of overseas countries is up from 29 to 35.

The location of UK members by county is shown on the map.


Shetland 1
Northern Ireland 10
Channel Islands 6

The response to the Activity Survey was excellent with most members responding. There were very many comments - all of which were welcome be they complimentary, critical, or constructive. The general tone illustrated by the excerpts published in RIG 32 continued as the renewals flowed in.

The following summaries use only data from this year - all previous data were deleted.

Receiving polar orbiters .. 886 Geostationary . 523

HRPT ..... 32 PDUS 28

Again this year HRPT and PDUS reception has doubled.

Viewing method:-

Computer 684 Frame store 261 Normal FAX 51 Photographic FAX 8

Compared to 1992 there is a big increase in the use of computers and a small decrease in the use of frame stores.

Types of computer:-

IBM compatible 566 Archimedes ... 58 BBC 59
Amiga ..... 52 Atari ..... 21 Macintosh 7

The IBM shows a large increase in popularity: all others (except for the Mac, last year 5) show a decrease.

Viewing hardware/software:-

Dartcom ..... 283 Timestep ..... 194 Home-brew ..... 163 Maplin 94
Martelec ..... 62 ICS ..... 18 Spacetech ..... 7 Quorum 2

Receiving equipment:-

Timestep ..... 400 Home-brew ..... 127 Dartcom ..... 104 Martelec 66
Maplin 53

Many members still get satisfaction from home construction - this was emphasised by many requests for more constructional articles in the Journal.

288 members experience interference. This is less than last year (313) which is good news - presumably receivers in use now have greater immunity.

146 (9%) members are involved with education. This is a larger number but smaller percentage than last year (123 (10%)).

This second year of my functioning as Membership Secretary has gone smoothly with few problems, although the influx of new members has substantially increased the work load.

The P.O. box has dealt faultlessly with a large quantity of mail, including one addressed to "The Remote Imagining Group", which perhaps is one way of describing us!

There were a few errors on my part early in the year for which I apologise to those affected. I reckon that 99.6% correct performance was achieved: with the RIG policy of Continuous Quality Improvement I hope to do better in 1994.

Please, all of you, fill in and return the Renewal Form and Survey in this issue. Remember, sending reminders costs me time and RIG money.

* * * * DO IT NOW ! * * * *

ENCRYPTION...

We indicated in the last issue that we were setting up an Action Group in order to negotiate the EUMETSAT encryption plans, but due to the Summer holidays and other problems there is not a great deal of action to report. One of our members, Frank Bell has however been in contact with the Prime Minister, and the various government departments, together with a high ranking official in the Meteorological Office, and various lines of enquiry are being pursued. At this present time there would seem to be some discrepancy between EUMETSAT's policy of education and scientific establishments not being charged on a regular basis, and the British Meteorological Office's national policy. However, we are still in the process of making representations.

FOR SALE...

Martelec MSD20 95cm spun aluminium dish complete with silver plated dipole feed, mounting plate and tripod arms.
Dish includes integral tubular steel patio mounting ring £95.00

Pair of TH2 Imaging METEOSAT 37 element loop Yagi kits.
Complete with 'N' type connectors and full instructions.
£45.00 each plus £5.00 postage.

Contact Trevor Smithers (G0KTN) on 0225 703726 after 6p.m.
(Melksham, Wilts)

DISH UP THIS IDEA!

Geoff Brown, GJ4 ICD, Jersey, C.I.

I had initially installed a Quad loop yagi antenna for my met system and for about three weeks things were going fine, until one day we had a real down-pour, and the system increased it's noise level, and the signal nearly vanished.

After many tests I had decided that there were problems at the antenna end; the yagi was dismantled and taken indoors for inspection; it was found that the manufacturer had inserted a small amount of foam inside the feed point; this had obviously become waterlogged and detuned the antenna!

After a dry out with a hair dryer and a spray with WD40 all was back to normal; well for another few weeks or so.

I eventually became fed up (not really the words I would like to use) with climbing onto the roof and having to dismantle the antenna, so several companies in the UK were contacted regarding a dish and feed for 1691 MHz.

There were plenty of feeds and dishes but nobody could supply me with a mount for a patio, in fact Dave Cawley told me that he had just lost a sale because of a 'no patio mount situation'.

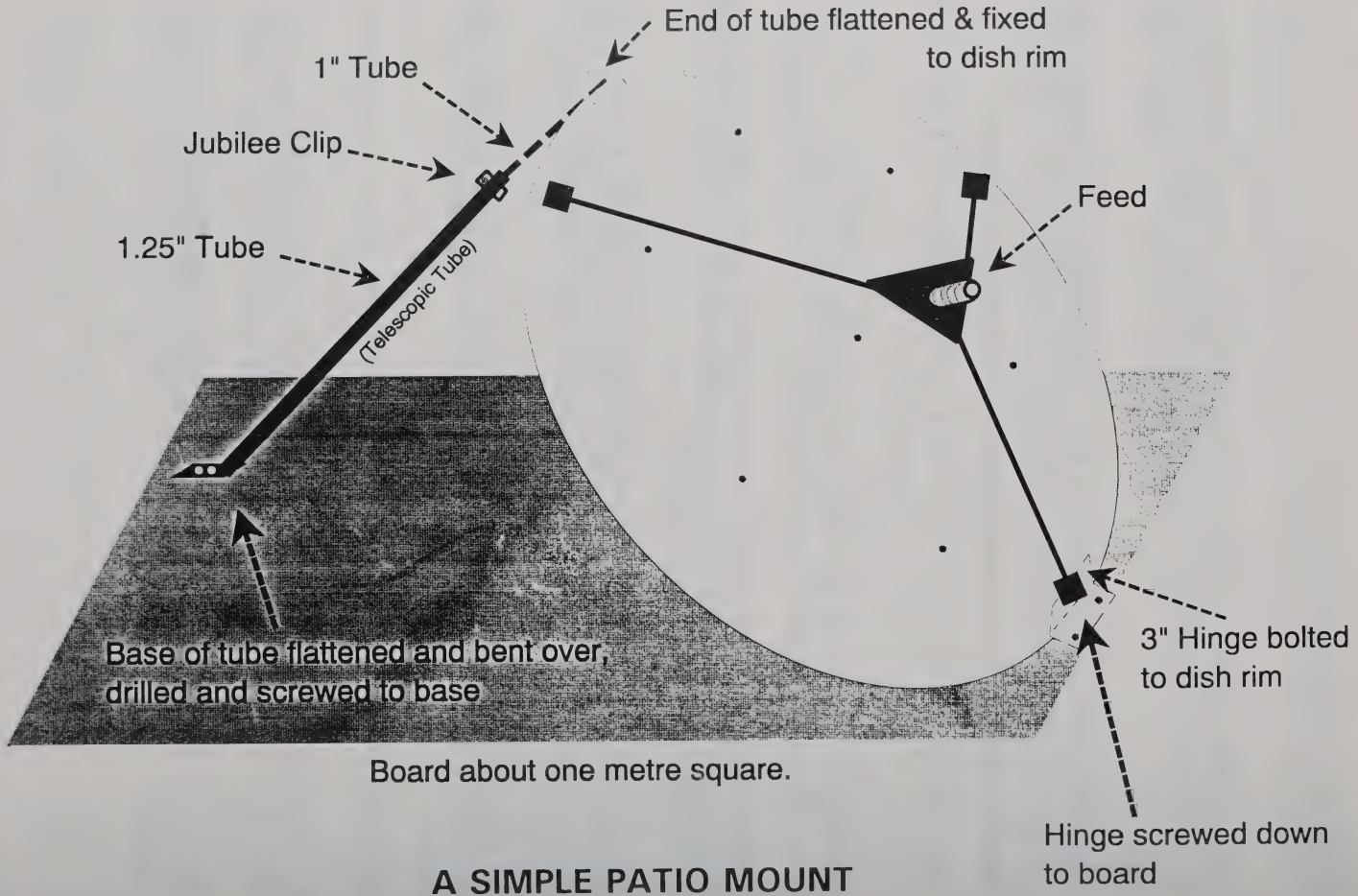
The 1 metre dish eventually arrived and I set about making a very simple mount, a stainless steel hinge was fitted to the front lip of the dish with brass hardware and then screwed firmly down to the marine ply base I had acquired.

At the rear a telescopic tube arrangement, about 36" was fabricated from 2.5cms and 3cms aluminium tube with the ends flattened and bent to suit the angles.

Where the two tubes met, saw cuts were put in the larger of the tubes for about 2" and a jubilee clip was used to give a telescopic arrangement.

Up went the dish; on with the receiver; a quick swing to 180 degrees and about 31 degrees elevation and perfection was achieved with masses of gain.

And so the moral is... If you have room in the garden, install a dish rather than a quad loop yagi. Go ahead, save yourself a lot of money and have reliability.



A SIMPLE PATIO MOUNT

FROM CROP CIRCLES TO CLOUD CIRCLES, UFO to the RAF?

David Watson

The Department of Physics and Astronomy at the University of Leicester, where I work, have recently introduced a new honour's degree course in Physics with Space Science and Technology. This course, having run for three years, produced its first batch of final year students in 1993. It is usual, in our department, for final year, students to undertake a project related to their discipline. It was with that thought in mind that a colleague, Mr Tom Preston and myself, decided that an HRPT ground station would be an ideal basis for one or more projects.

This station was set up in September 1992 using a 386DX 33MHz PC with a 120 Mbyte hard disc and the Timestep HRPT receiving equipment and tracking software, to the specification that was current at that time. The dish and metalwork being supplied by Harrison Electronics.

The project went well and the equipment was well exercised by the two students, whom both produced good project reports at the end of their allotted term. These reports produced several observations and recommendations that have gone into improving the hardware, software and operations.

Briefly, these included the requirement for up to date satellite elements to maintain the accuracy of the gridding, particularly if this is being used to pinpoint ground reference points. The requirement for additional storage capacity, a 240 Mbyte disc was added and I consider this configuration to be the minimum for serious use.

The HRPT software often crashed when generating the box used for defining the data processing area. This was tracked down to our use of the supplied Logitec mouse driver that possibly allowed a divide by zero error when the box was reduced to zero size. This was completely rectified by a return to the standard Microsoft mouse driver supplied with MSDOS.

The rotator drive that we have allows a maximum azimuth rotation velocity of 6 degrees per second and this is insufficient for our 1.5 metre dish with 7 degree beam width for satellite passes between 75 and 85 degrees elevation. This though, has not caused any serious inconvenience and only a few seconds are lost during some overhead passes. Manual tracking is in general very satisfactory, (just keep ahead of the satellite and move on only as the signal strength starts to drop).

It was during the reconfiguration period after the end of the first project period that I quite by chance received the images shown. At the time there was very heavy cloud cover over the majority of the pass, and it was only by using the grid function that it was possible to find the UK at the edge of the

scanned track. I contrast stretched the area and for a second, and stared at the screen in disbelief. Was I looking at an instrument or a satellite fault? Realisation then dawned that this image was real and that there was real evidence of life on the planet below! I carefully saved the image to prevent accidental loss and established that the next pass was also visible. The second image shown, is from that following pass some 100 minutes later.

After the initial surprise, I thought that what we were seeing was an aircraft in a holding pattern or stack over Stansted Airport that is situated at the western end of the spiral of the first image. This may have been subjected to wind shear, producing the spiral shown, however, after the reception of the second image this showed the pattern had changed very little but had drifted in a south easterly direction, en masse, making the wind shear theory very unlikely.

The RIG 'get together' or Conference proved very useful as I was able to discuss the images with both Jim Bacon and Henry. Both pointed out a now obvious point, that it was very likely that the first image was still being produced by the lack of dispersion at the easterly end. This can be confirmed by the second image that shows a clockwise exit loop.

A temperature slice also reveals that the easterly end is several degrees warmer in the first image compared to the second, also indicating it was still in the making when first seen. From the temperature it is also possible to get an approximate altitude of about 5,500 metres, which is quite normal for an aircraft. Also the North Sea is often used by the military for aircraft exercises.

So what do we have so far; almost certainly aircraft activity; the spirals show the actual flight path, requiring a good degree of flying skill. It is very unlikely to be a civil aircraft as the time to generate this track was several hours, unless produced by multiple aircraft and to that end there are at least two distinct diameters of trails.

Finally Henry, with his contacts with RAF air traffic, has indicated that four Canberra bombers were on exercise over the North Sea at that time. It would be very interesting if it could be confirmed that the trails were caused by these aircraft.

If there is anyone who can shed any more light on the problem, I would be very pleased to hear from you. If you actually made the trails, I will send you a good print!

Figure 1 - from NOAA 11 15th Apr 1993 HRPT Ch 4 13.46 hrs GMT.
Figure 2 - from NOAA 11 15th Apr 1993 HRPT Ch 5 15.25 hrs GMT.

File Section Receive Display Grid Colour Options Quit

File
Section
Receive
Display
Grid
Colour
Options
Quit

THE YEAR IN SPACE
'Circuit Breaker'

The recession has hit everyone this year, and space-watchers everywhere have had a lean time of it. In the UK, not only has the Starship Enterprise ceased from going to where no man had been before, but we have had to suffer it going back to where we long thought it had left behind. No doubt the shape of things to come.

However in these dark days a new ship will come to our rescue, - sponsorship. Almost mandatory now if you want to get anywhere. Soon your last glimpse on a hospital trolley, before the anaesthetic gets to you (if the trust budget is holding out) will be of a surgeons uniform informing you that you will have your innards removed courtesy of 'Tasty Snacks'.

So it can't be long before your favourite NOAA picture will have most of the data overwritten with discrete advertising. Logos like, 'Enjoy a Big Mac at The Restaurant at the End of the Universe' will doubtless become commonplace. And anyway, why waste the output channels of a scanning radiometer on fresh data when you could have them replay repeats of last year's favourite weather.

But the main change, as everyone knows, is that the weather has been privatised. The air we breathe is probably now recycled by some enterprising company or other. All contributions to the ozone layer are gratefully received.

But on a more sinister level, typical of late 20©. political correctness, the faceless bureaucrats have used tax payers money in order to ensure that tax payers no longer have access to what tax payers are obliged to continue to fund.

All that beautiful satellite technology, and what will we now get for it all? A two minute Michael Fish forecast. No disrespect intended Michael, but where's our value for money? All because someone, somewhere decided that it was the Met Office who now owned any pictures taken from higher than the roof at Bracknell.

Ah sweet reader, you will doubtless remind me that I've forgotten the newest and latest in Met Office innovative outpourings - the fax broadcast. Now there's minimalist doctrine for you.

Since some prat has found that they have a fax machine which isn't doing anything very much in the office, similar to some admin staff, and since some clerk accidentally wired it up to the back of a computer, BT and the Met Office are poised to make mega bucks out of harmless weather image addicts and defenceless hard-pressed schools, as the 'de rigueur' upgrade from rotten

ole' live reception. But don't forget to write and tell the authorities how impressed you are at the amazing quality of the FAX images that you can get, and what a vast improvement they are upon those horrible old 256 grey level, temperature calibrated, animatable, continuously available, full resolution ones you used to have to endure.

And for the future? The famous Thatcher's law states that more and more data will become available to less and less people, so that ultimately only one person will know everything there is to know about the weather, which is fine except that this person's real interest lies in salting away Picassos in a vault. But there you go, now the family silver's been sold we've got to earn a living again. I suppose it's inevitable given that now they're putting VAT on fuel bills Arianne launches will be even more expensive!

The boys at Lannion are our last hope. Since Meteosat 3 went west, they've done their level best to justify their existence, even though Wallops island and Darmstad have most of the say so these days. They at least seem to be untouched by the Meteosat Mafia, and remain true to their cause. We feel that they are much more like us in many ways, just amateurs trying to scratch a living.

We're not sure whether they're working with a lap-top or a proper 286 desk job (if there's room in their shack). But they gave the game away earlier in the year when slowly but surely the start times of their transmissions drifted backwards. Just like on your average good old PC!

Then someone twigged and typed in a new time when they booted the machine up, and we were back to normal. Until of course the clock started drifting back again.

Someone should buy them a copy of RighTime for Christmas. Actually, in fairness the staff at Lannion should be rewarded by EUMETSAT as having brought out their own pre-1994 version of encryption, known as LE EN-CORRUPTION. They've been beta testing a module for most of the time they've been operating METEOSAT 3, and it's extremely successful.

Most days large areas of the US are rendered invisible by incoherent rubbish - possibly interleaved EUMETSAT policy documents again?

Meanwhile, back on the ranch, things are looking down. In Uncle Sam's used space-craft lot, if you're lucky by late next year you may be able to pick up a half-decent polar orbiter for next to nothing, with only the odd motor problem or two.

They've not been so quick as EUMETSAT though, as no-one seems to want to buy a second-hand NOAA. A recent attempt at flogging NOAA9 to the Chinese as a kind of USA take away, met with searching questions as to the

number of orbits. On producing the service record an inscrutable mandarin gave the rebuff, 'No thanks, too revolutionary'. All of this is just as well, as a glance in the showroom reveals not a lot by the way of new launches.

NASA gets the much coveted 'Hubble, bubble' award, for having managed to lose one military, one weather satellite and a Martian probe all in the space of a month. (I use the term space advisedly!) If there's any scrap merchants reading, there's a 30 square feet lump of useless metal that was a 60 million dollar satellite ready for the taking somewhere. It gives a whole new meaning to the expression US!

The USA Geostationary programme (which for the benefit of our younger readers in the land of super-heroes, used to mean three weather satellites in the Clarke Kent belt) has been disbanded. Unfortunately it fell foul of planetary planning laws which insisted on an inter-galactic public enquiry. Following the lodging of several objections by Venusian wart-hogs wanting to preserve earth's space as an area of outstanding natural ugliness, and Lunar residents complaining that these things spoiled their reception of Red Dwarf VI, the whole thing went to the President on final appeal. He wondered whether GOES-8 was some kind of new fizzy drink, and considering how there was already 7-UP, he didn't see the need for any more. Goes next? Just a flight of fancy sir. Buy the simulator instead!

But if you thought we had problems, spare a thought for our Soviet RIGleys. Instead of a brand new 'K' reg NOAA or METEOSAT 6 to look forward to, he has had to be content with the odd old high mileage 'G' reg (pre-democracy, one unscrupulous owner) METEOR 3-3 or 3-4.

What about Meteor 2/21 I hear you scream in their defence. Where did they get it from I ask? And what's powering the output? Coal? Mind you, if it's anything like their cars, I'm surprised we haven't heard complaints from astronomers about the pollution in space caused by the MET's engines.

But then there's China. Ah so! Now there's a nation to keep your eye on. But they're into leap-frogging. So forget your APT, forget HRPT, and say 'harrow' to Super HRPT.

I can just see all the manufacturers falling over themselves in the rush to construct new receivers for 10 channel CHRPT, but before you do that boys, just stop and ask yourself - is it worth it for just six months? Well, you know what they say, 'a year in space is a long time', and 1994 can only get worse.

But as our hobby teeters on the brink of extinction we must fight back with all the irritant powers of a dog's flea. Otherwise our children will look at the empty spaces on our patios where once ruled the mighty dish, and ask pathetically of us, "And what did you do in the War, daddy?"

INFO... NOAA 13 - The Demise

NOAA 13 was launched on 9th of Aug. and was checked out by NASA. It was handed over to NOAA on 12th Aug. who continued checking over the Spacecraft. Towards the end of 21st Aug. ground controllers noticed that there was a problem during a low elevation pass. Data showed that the 3 x 26.5 amp/hour nickel-cadmium batteries had very low voltage, and many test points were out of normal specification. Ground controllers were fortunate enough to download a considerable amount of internal housekeeping data before the satellite went below the horizon.

When it should have re-appeared on the next orbit there were no transmissions at all. NOAA 13 had died. When the dumped data it was analysed it was found that the Solar cells were working correctly but the batteries were not being charged! This task is performed by a voltage regulator type of circuit. Within one orbit the remaining charge in the batteries was consumed and the satellite was never heard again. The faulty transistors were probably from the same batch that caused a clock oscillator being changed earlier in the year (before it was launched).

A similar faulty transistor probably resulted in the Mars Orbiter having a terminal illness. That wasn't the end of the bad luck for the Americans. We all know that bad luck goes in threes. Landsat 6 was launched and was reported to have suffered from a similar catastrophe. The moral must be that Murphy still rules:- If it can go wrong - it will!!! The batch of transistors that seems to have caused these problems had a failure rate of 10% and it was caused by a faulty weld. Anyone wishing to salvage the equipment should apply to NOAA and have a supply of good BC108s and a long set of Jump Leads!

(This data has been gleaned from several sources).

NEWS UPDATE...

MAPLIN - Maplin Electronics have currently suspended their METEOSAT Yagi and Down Convertor kit due to component supply problems. It may require a redesign of the circuitry and the consequent delay may run into months rather than weeks.

METEOSAT AND THE PC - Boger-Funk, a German firm has produced a card for the PC which is a complete METEOSAT receiver and interface board. All that is required is a dish and pre-amp. More details from the company at: Grundesch 13, 88326 Aulendorf. Tel: 010 49 75 25 451

(We are grateful to Alan Jarvis of Cardiff for the above news items.)

RIG COMPETITION - RESULTS

A selection of the entries is reproduced below...

"The lines from my laser printer are not as good as the lines on my shirt!!"

"...Then I obtained a degree in 'Waffling' at the University of East Anglia..."

"Will the owner of a yellow combine harvester which is blocking the hotel entrance please remove it!!"

(All above three from Keith Holland, G3MCD, 40 Brookland Rise, London NW11 6DS)

"Will the joker who wiped my tie on his toast at breakfast, please see me at break time."

"Is there anyone to challenge me in the Freddy Trueman look-alike contest?"

"The picture for the new RIG shirts got spoilt, so they just printed sync bars.."

"Einstein glasses like these are on sale to make RIG members look more intelligent, like me!"

"May I have a volunteer to nip along to a car boot sale and get a slide projector that works!"

"As you can see by the state of this name badge, I had some more trouble with my laser printer."

(All six above from Graham Smith, G1JVZ, 3 Beech Hill Crescent, Mansfield, Notts NG19 7EW)

"Alright - stand up the one who left this in room 648."
(Denis Whitbread, 44 Westlands Rd., Hedon, Hull HU12 8BX)

"They are going to ask HOW MUCH for this Eumetsat De-encryption card?!!!"
(K.L. Bond, 20 Hunton Bridge Hill, Hunton Bridge, Kings Langley, Herts WD4 8PU)

"If I find the blighter that dipped my tie in his beer, he's for it!"
(David Watson, 1 Brownhill Crescent, Rothley, Leicester. LE7 7LA)

And the Winner is...
"...Then I obtained a degree in 'Waffling' at the University of East Anglia..."
from Keith Holland who will get his 1994 Subs paid free.

THE GLOBAL POSITIONING SATELLITES (GPS)

Alan Jarvis

These are a series of 12-hour orbiting satellites put up by the American Department of Defense at a height of some 12,500 miles. When the system is complete there will be a total of 21, with 3 spare. Data from up to 8 of these satellites can be used to determine one's position, speed, direction of travel, height and more, anywhere on or above the earth.

Although they are primarily for US military purposes some of the data is available to the world at large. A variety of dash mount and hand-held receiver/decoders is now obtainable. Through the good offices of a private pilot friend I recently had the opportunity of trying the Flightmate made by a company called Trimble.

It costs about £700 and is no larger than any other hand-held radio. We first used it to find the exact latitude and longitude of my home, which I had plotted many years ago from a 1:50000 OS map. I had made my position to be 51 29N, 3 13W.

The Flightmate first started looking for GPS satellites and announced in the LCD readout how many it had captured. It ended up with 8, this in my front garden on its internal aerial. After a pause it gave my position as 51 29.160N, 3 13.275W.

Then we laid in Cardiff airport as a destination, using the standard international code EGFF. It gave a heading and a distance. During the 12 mile car drive it continuously told us how far we were off a direct track to left or right and the heading to steer to get back on track.

Three times on the journey we crossed over the exact track. It also gave me continuous readings of my height above sea level and my speed in miles per hour. I was able to check my speedometer from 5mph to 70mph and I found it was never more than about 3mph inaccurate. It will actually show one's speed and heading at walking pace.

A quite incredible piece of electronics. It picks up all the data with its internal aerial and then does some pretty nifty arithmetic. A small external 2" diameter aerial can be fastened to the window of a car or aircraft.

Only once during our journey, in a small deep valley with heavy tree cover, did it announce it only had 2 satellites and went on hold for about 50 yards.

I do not know the rf output of the GPS satellites, nor indeed of Meteosat. But I did wonder why we need yards of Yagi or immense dishes to pick up data from Meteosat.

INTERPRETING WEATHER SATELLITE IMAGERY - PART 6

Peter Wakelin

In the last issue I showed how sea-breezes can influence cloud formation but there are other characteristic cloud patterns which can give an indication of air motion. This time I shall describe how air movement in the vicinity of mountains can affect cloud structure. To understand the processes involved it will help if I briefly explain the concept of atmospheric stability.

The atmosphere is three-dimensional with vertical, as well as the more familiar horizontal motion taking place. The concept of atmospheric stability refers to what happens to a small parcel of air when it is displaced vertically, in either direction, for whatever reason.

A parcel of air rising through the atmosphere expands because the pressure exerted upon it decreases with height. In expanding it cools but if it is then still warmer than the surrounding air, its buoyancy will make it continue its upward motion until its temperature somehow becomes equal to that of its surroundings. When, after an initial disturbance, the parcel continues to rise the air is said to be unstable.

If, on the other hand, a parcel of air displaced upwards finds itself colder (and therefore more dense) than the surrounding air, it will tend to return to its former level and the atmosphere is said to be stable. Neutral stability is the term used when vertical movement is neither encouraged nor opposed.

When moving air encounters a mountain range it must either deflect sideways or go over the top. Light winds may be deflected but strong winds will usually be forced up the slope. If the air is unstable and sufficient moisture is present then convective cumulus or cumulonimbus cloud will develop, possibly leading to showers or thunderstorms.

When a stable airflow is forced up a slope cumulus clouds will not form but a smooth-topped layer of cloud is more likely. It is not just the low-level flow which is affected by the mountain. In a stable flow the air can be disturbed up to several times the height of the summit.

The illustration shows what can happen to two moist layers present in a strong, stable airstream encountering a mountain range. In the lower flow oscillations have been set up in the airstream and these lee-waves can extend many kilometres downwind if the stability of the air is close to neutral. In this example the air cools sufficiently near the crest of each wave for its water-vapour content to become saturated enabling cloud droplets to form. Air descending into the trough warms so the cloud evaporates only to reform at the next crest.

BREAK IN CLOUD LAYER IN WAVE TROUGH
CLOUD FORMS AT CREST OF WAVES

My NOAA 12 image shows an example of this phenomenon extending over an unusually large area. Waves generated in a stable northwesterly airstream over the mountains of Scotland extend well out into the North Sea.

There is evidence of wave activity over NW England, N Wales and SW Ireland too. The clouds are probably at about 2 to 3 Km altitude.

When the air is extremely stable the oscillations are damped out very rapidly and there may be just a single wave cloud above the mountain. It may appear stationary but air is, of course, moving through it, often at great speed, with cloud forming on the upwind edge and dispersing from the leeward edge.

The upper part of the illustration shows what can happen when a cloudy layer in a very stable airflow passes over a mountain. Here, the descending air to the lee of the peak causes the cloud to evaporate for a time before reforming further downwind as the air returns to its former level.

In the IR image of South America a band of high, cold, cirrus cloud associated with a strong west-north-westerly jet-stream crosses the Andes near 30 degrees south latitude. The Andean peaks exceed 6 Km altitude at this point and the cloud height is probably around 12 Km. Although there is just a hint of jet-stream cirrus at 80 degrees west longitude the cloud really begins to develop around 72W. It is probable that the influence of the Andes is significant this far west. The break in the cloud band caused by the descending air just east of the mountain range is very prominent.

I mentioned earlier that air cools as it rises and warms as it descends but I did not quantify the temperature changes. If very dry air is forced up a mountain it cools at 10C for each Km of rise in altitude. On descending the other side it warms at the same rate. If the air is moist, latent heat is released when the water-vapour condenses out to form clouds and this additional heat reduces the rate of cooling to around 6C per Km. If all the moisture falls out as rain on the upslope the air will still warm at 10C per Km on the descent so will finish up warmer and drier on the lee side of the mountain. This warming is known as the föhn effect and is quite common to the lee of most mountain masses. Southern Chile is one of the cloudiest and wettest places in temperate latitudes yet just over the Andes in western Argentina cacti thrive.

The wettest places on Earth are, not surprisingly, in mountainous areas. Warm, very moist, unstable air from the Indian Ocean is forced up the southern slopes of the Himalayas during the monsoon. Thunderstorms with high intensity rainfall last for weeks on end. However, the wettest known spot on earth is on the island of Kauai in the Hawaiian archipelago. There the stable, moisture-laden northeast trade-winds are funnelled into a valley and forced up a mountain slope. Rainfall intensity is not high but is continuous day and night throughout the year resulting in nearly 30 times London's rainfall. The other side of the island is dry and hot.

NOAA 12 HRPT CH 2 1993 JUNE 27 0745 UT

METEOSAT 3 VIA METEOSAT 4 IR 1993 SEP 29 0750 UT
20 S
30 S
40 S
50 S
70 W
60 W
50 W
40 W

My final paragraph is about the South American image but has nothing to do with wind or cloud. I used the Neopaint programme to crop and annotate the image but I did not paint the dark blob at 39S, 52W! Remember that this is an infrared image. The sea off the Argentinian coast is almost cloud-free so the colour changes are due to temperature differences at the sea surface. Here the very cold Falkland current is moving north off the coast of Argentina while the Brazilian current carries a narrow stream of very warm water southwards at 52W. The temperature contrast at 39S is probably about 15C.

RIG CONFERENCE 94

Due to the amazing success of this years conference (see James Brown's article page 20) we are considering either doing it all over again in 1994 as a 3 day residential conference or maybe just a one day show.

The location is undecided and could range from Manchester to Bristol or Cambridge to Watford.

This will be once again the opportunity to meet the World's experts in Remote Sensing and a chance to see all the commercial equipment you dream about, working live.

There will be plenty of time to sit in groups and reminisce about Framestores over a cup of tea or coffee. Maybe even a bring and buy stall ?

If you are interested please drop me a line and let me know what you think:

Sam Taylor, RIG, Fieldfare, Wickhambrook, Newmarket, CB8 8QA.

FOR SALE...

YU3UMV Framestore for NOAA, very nicely made and cased, with all documentation. Fully working and needs 12.6v PSU.
Price including delivery UK, £140.00

G0HFB QTHR (LOOE) 0503 262823.

JVFAX V6.0... THE FINAL VERSION?

Mark Pepper

I have just received what the author unfortunately, refers to as his LAST efforts in JVFAX, version 6.0. The following is a very short description of new additions to the package and a few initial comments made after using it for just a few minutes.

The new features are as follows:

Transmit and receive SSTV in the most commonly used modes.

Picture masks for prettier geostationary satellite pictures.

Up to 192 dates in one date file.

Contrast/brightness adjustment and histogram equalisation for picture post processing.

Finally, the HAMCOMM transmit/receive switching does work.

Generate transmit audio on the TxD line.

Up to 20 definable FAX modes.

Automatic weather movie generation of zoomed picture portions.

An additional 640x480x256 movie mode for users of ET4000 graphics cards. 'True' squelch mode with noise detection for the unattended reception of low orbiting weather satellites.

Better phasing to NOAA satellite transmissions. Etc. ...

As soon as I installed V6.0 I connected up my Meteosat receiver and a modified PixelPlus decoder to my serial port. I Set up my Trident video card and the correct interface type in the configuration menu. A mere three button presses later and I was in FAX receive mode just before a D3 Met 4 image arrived.

To my amazement not only did JVFAX synchronise and start displaying a picture but the picture was in full colour. The picture had the greenest land, bluest sea and greyest cloud I had seen. I've tried many other packages and their colour options and even colour combination experiments but I have never had such a good colour picture so instantly.

By the time you read this V6.0 will be available on the RIG BBS.

METEOSAT No.3 ALIVE?

James Brown

Probably for many RIG members, the last time they received live Meteosat 3 transmissions was when it was at its temporary home at 50 degrees West. However, as most will remember, it was moved at the beginning of last year yet further west to 75 degrees, and hence below the horizon for a large part of the country.

However, as far as those of us who have the good fortune to live down here in the South-West of the country, METEOSAT 3 is still very much alive and kicking! Admittedly, it is only 2.8 degrees above the horizon here in South Wales, but with a clear view from the roof down the Bristol Channel, reception is not only possible, but more than adequate on most days. I have only a famous 'Henry' loop yagi, and that goes directly into a Dartcom downconvertor without a pre-amp, but results are quite respectable. In fact, if METEOSAT 3 didn't suffer from the notorious 3db dips in signal output at every rotation, results would be perfect. As it is, only a few noise speckles usually show up on Infra Red pictures, coinciding with the noise dips.

The advantages of direct reception of METEOSAT 3 are firstly the increase in the frequency of pictures. Instead of having to wait for the three hourly APT relays from METEOSAT 4, the main USA area is covered every hour.

Secondly, visual images are available for much longer, and not restricted by EUMETSAT's 'curfew'! Thirdly, Water Vapour images are available, which neither APT nor PDUS relays contain.

The visual channel picture accompanying this text is a mosaic of the six single visual transmissions, untouched apart from the removal of headers in the centre. There is some degree of overlap, but image rectification seems to make it almost impossible to get a perfect mate. No attempt has been made to remove noise, but there is very little on the visual images anyway. For some unknown reason the north of Canada is curtailed as compared with the south pole.

One of the interesting things in terms of reception, is the increased effect of atmospheric conditions. There appear to be fluctuations, both short and long term in received signal strength. If any other readers receive METEOSAT 3 live, I would be most interested to hear of their findings. There certainly seem to be some interesting propagation factors involved at such a low level of azimuth.

At the moment transmissions seem reasonably safe, although if GOES 7 should develop a fault then there is a provision to move METEOSAT 3 to a yet more westerly position, which would then finally remove it from a UK view. Hopefully, there will be a GOES 8 before that occurs!

METEOSAT AND SOLAR INTERFERENCE

Peter Wakelin

Q. What do the Sun and Meteosat 4 have in common?
A. They both radiate on 1694.5 MHz.

Although the sun radiates most of its energy in or near the visible part of the electromagnetic spectrum it also radiates at radio wavelengths. Because of the seasonal movement of the sun there are two periods each year when it's apparent movement across the sky takes it close to Meteosat (and all other geostationary satellites) and interference can be experienced. On a SDUS image the interference may show as increased noise but on a digital PDUS image data may be lost completely.

From NASA 2-line elements I computed Meteosat 4's position at midday on 9 October to be 1.1 degrees west and 0.1 degree north which translates to azimuth 180.5 and elevation 31.7 from my location. The sun crossed this azimuth at 1151 at an elevation of 32.4 degrees, just 0.7 degree above Meteosat.

The AV format image is transmitted just once a day commencing at 1134 and its huge 30Mb file takes nearly 24 minutes to send down. I have annotated the image received on 9 October with approximate times of reception (see opposite page). Although the image was perfect initially some data losses soon became evident which reached a peak when the sun passed by. Reception improved again as the sun moved away.

Around 1 March the northward moving sun will again become collinear with Meteosat 4 but due to the Earth's eccentric orbit will occur about 25 minutes later.

FOR SALE...

Martelec MSR 30 Satellite receiver. Almost new. £100
Omnifax 4.0 Satellite tracking package. Board, Disks, Books. Complete £85
Stan Swetman, Coulsdon, Tel: 0737 556091

Due to upgrading the following is available:
New & unused framestore boards (3) Tested with all chips in sockets. Choice of memory chips 4164 256
Psion LZ64 64k Datapack, Comms Link, Para Link, Mains adapter, soft case.
Offers to: Graham Hewitt on Great Yarmouth (0493) 728194

1157
1146
1135

A LOW-COST 137 MHz RECEIVER

Ray Godden

The stimulus for this project was the availability (from RIG) of a supply of 10.7 MHz crystal filters of suitable bandwidth. These together with some ideas I had resulted in a design that has respectable performance, small size and a parts cost, excluding the PCB and case, of about £30 ($45, ECU40).

Unconventional design.

Most designs for this type of receiver are dual conversion, with the first IF at 10.7 MHz and the second at 455 kHz. Because the bandwidth of WEFAX or APT transmissions are neither as wide as broadcast FM or as narrow as NBFM filters of appropriate bandwidth are expensive and not generally available.

Therefore the receiver bandwidth is controlled mainly at 455 kHz with roofing filter(s) at 10.7 MHz. Since RIG has a windfall of 10.7 MHz filters of 38 kHz bandwidth a different approach is possible.

Now, as was pointed out by Roger Belcher in RIG 28, to allow for peak deviation, Doppler effect, modulation sidebands and tolerances a bandwidth of 50 kHz is required.

However as this filter bandwidth is specified at 1.5 dB the effects of truncating the sidebands under worst-case conditions are unnoticeable in practice. These filters, being rather high impedance, do need careful matching of terminations for a level response in the pass band: the values shown here have been checked with several samples.

The schematic is in two parts. The first is the RF and IF circuitry and the second the LF processing and channel scanning circuitry. I will describe the circuit functions stage-by-stage.

RF and IF stages.

The RF amplifier (TR1) is a dual-gate MOSFET with a tuned drain load. L2 and L4 form, with their resonating capacitors C8 and C9 and coupling capacitor C7, a loosely-coupled band-pass filter before the mixer (TR3). C7 is formed by a single turn of enamelled copper wire around the lead to L2; the result is a bandwidth of about 1 MHz - enough to cover the frequencies of interest whilst attenuating signals in adjacent bands.

The mixer is also a dual-gate MOSFET and the local oscillator drive is fed to gate2. A drive level of over 1 volt RMS is provided by the crystal oscillator

NOAA 9 PERIOD 101.93 MINS FREQUENCY 137.62MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

11/12	09.51	19.41	13/01	09.29	19.19	15/02	09.07	18.57
12/12	09.38	19.28	14/01	09.16	19.06	16/02	08.54	20.26
13/12	09.25	19.15	15/01	09.03	18.53	17/02	08.41	20.13
14/12	09.12	19.02	16/01	08.50	20.22	18/02	08.28	20.00
15/12	08.59	18.49	17/01	08.37	20.09	19/02	09.57	19.47
16/12	08.45	20.18	18/01	08.24	19.56	20/02	09.44	19.34
17/12	08.32	20.05	19/01	09.52	19.43	21/02	09.31	19.21
18/12	08.19	19.52	20/01	09.39	19.30	22/02	09.18	19.08
19/12	09.48	19.39	21/01	09.26	19.17	23/02	09.04	18.55
20/12	09.35	19.26	22/01	09.13	19.04	24/02	08.51	20.24
21/12	09.22	19.13	23/01	09.00	18.51	25/02	08.38	20.11
22/12	09.09	19.00	24/01	08.47	20.20	26/02	08.25	19.58
23/12	08.56	18.47	25/01	08.34	20.07	27/02	09.54	19.45
24/12	08.43	20.16	26/01	08.21	19.54	28/02	09.41	19.32
25/12	08.30	20.03	27/01	09.50	19.41	01/03	09.28	19.19
26/12	08.17	19.50	28/01	09.37	19.28	02/03	09.15	19.06
27/12	09.46	19.37	29/01	09.24	19.15	03/03	09.02	18.53
28/12	09.33	19.24	30/01	09.11	19.02	04/03	08.49	20.22
29/12	09.20	19.11	31/01	08.58	18.49	05/03	08.36	20.09
30/12	09.07	18.58	01/02	08.45	20.18	06/03	10.05	19.56
31/12	08.54	18.45	02/02	08.32	20.05	07/03	09.52	19.43
01/01	08.41	20.14	03/02	10.01	19.52	08/03	09.39	19.30
02/01	08.28	20.01	04/02	09.48	19.39	09/03	09.26	19.17
03/01	09.57	19.48	05/02	09.35	19.26	10/03	09.13	19.04
04/01	09.44	19.35	06/02	09.22	19.13	11/03	09.00	20.33
05/01	09.31	19.22	07/02	09.09	19.00	12/03	08.47	20.20
06/01	09.18	19.09	08/02	08.56	20.29	13/03	08.34	20.07
07/01	09.05	18.56	09/02	08.43	20.16	14/03	10.03	19.54
08/01	08.52	20.25	10/02	08.30	20.03	15/03	09.50	19.41
09/01	08.39	20.11	11/02	09.59	19.50	16/03	09.37	19.28
10/01	08.26	19.58	12/02	09.46	19.37	17/03	09.24	19.15
11/01	09.55	19.45	13/02	09.33	19.24	18/03	09.11	19.02
12/01	09.42	19.32	14/02	09.20	19.11	19/03	08.58	20.31

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

NOAA 10 PERIOD 101.12 MINS FREQUENCY 137.50MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

11/12	06.19	17.47	13/01	06.26	17.53	15/02	06.32	17.59
12/12	07.36	17.22	14/01	06.02	17.29	16/02	06.08	17.35
13/12	07.12	16.58	15/01	07.18	17.04	17/02	07.25	17.11
14/12	06.48	16.34	16/01	06.54	16.40	18/02	07.00	16.46
15/12	06.23	17.50	17/01	06.30	17.57	19/02	06.36	18.03
16/12	05.59	17.26	18/01	06.05	17.33	20/02	06.12	17.39
17/12	07.16	17.02	19/01	07.22	17.08	21/02	07.28	17.15
18/12	06.51	16.37	20/01	06.58	16.44	22/02	07.04	16.50
19/12	06.27	17.54	21/01	06.34	18.01	23/02	06.40	18.07
20/12	06.03	17.30	22/01	06.09	17.36	24/02	06.16	17.43
21/12	07.20	17.06	23/01	07.26	17.12	25/02	07.32	17.18
22/12	06.55	16.41	24/01	07.02	16.48	26/02	07.08	16.54
23/12	06.31	17.58	25/01	06.37	18.05	27/02	06.44	16.30
24/12	06.07	17.34	26/01	06.13	17.40	28/02	06.19	17.47
25/12	07.23	17.10	27/01	07.30	17.16	01/03	05.55	17.22
26/12	06.59	16.45	28/01	07.06	16.52	02/03	07.12	16.58
27/12	06.35	18.02	29/01	06.41	18.08	03/03	06.47	16.34
28/12	06.10	17.38	30/01	06.17	17.44	04/03	06.23	17.50
29/12	07.27	17.13	31/01	07.34	17.20	05/03	05.59	17.26
30/12	07.03	16.49	01/02	07.09	16.55	06/03	07.16	17.02
31/12	06.39	18.06	02/02	06.45	16.31	07/03	06.51	16.37
01/01	06.14	17.42	03/02	06.21	17.48	08/03	06.27	17.54
02/01	07.31	17.17	04/02	05.56	17.24	09/03	06.03	17.30
03/01	07.07	16.53	05/02	07.13	16.59	10/03	07.19	17.05
04/01	06.43	18.10	06/02	06.49	16.35	11/03	06.55	16.41
05/01	06.18	17.45	07/02	06.25	17.52	12/03	06.31	17.58
06/01	07.35	17.21	08/02	06.00	17.27	13/03	06.06	17.34
07/01	07.11	16.57	09/02	07.17	17.03	14/03	07.23	17.09
08/01	06.46	16.32	10/02	06.53	16.39	15/03	06.59	16.45
09/01	06.22	17.49	11/02	06.28	17.56	16/03	06.34	18.02
10/01	05.58	17.25	12/02	06.04	17.31	17/03	06.10	17.37
11/01	07.15	17.01	13/02	07.21	17.07	18/03	07.27	17.13
12/01	06.50	16.36	14/02	06.57	16.43	19/03	07.03	16.49

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

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Polar Orbiters ☐ Geostationary ☐ HRPT ☐ Primary Data ☐

How do you view the images?

Computer ☐ Framestore ☐ Fax ☐ Photographic Fax ☐ Other .....

If you use a computer for remote imaging, what type is it?

IBM PC or compatible ☐ Amiga ☐ Atari ☐ BBC ☐ Archimedes ☐
Macintosh ☐ Other .....

For receiving, whose receiver/preamp/downconverter do you use?

Dartcom ☐ ICS ☐ Microwave Modules ☐ Timestep ☐ LMW ☐
Martelec ☐ Maplin ☐ Homebrew (inc. RIG LNA kit) ☐ Other .....

For displaying the images, whose equipment do you use?

Comar ☐ Quorum ☐ Homebrew ☐ Other .....

Do you suffer from interference? ☐ Are you involved in education? ☐

RIG is considering supplying images on CD-ROM. Have you, or do you expect to have, a CD-ROM drive? ☐

Also we are considering offering an image printing service. Would you be likely to use such a service? ☐

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NOAA 11 PERIOD 101.97 MINS FREQUENCY 137.62MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

11/12	05.25	15.16	13/01	05.24	15.15	15/02	05.21	15.13
12/12	05.13	15.04	14/01	05.11	15.02	16/02	05.09	15.00
13/12	05.00	14.51	15/01	04.59	14.50	17/02	04.57	14.48
14/12	04.48	14.39	16/01	04.46	14.37	18/02	04.44	16.17
15/12	04.36	14.27	17/01	04.34	16.07	19/02	04.32	16.05
16/12	04.23	15.56	18/01	04.21	15.54	20/02	04.19	15.52
17/12	04.11	15.44	19/01	04.09	15.42	21/02	05.49	15.40
18/12	05.40	15.31	20/01	05.39	15.30	22/02	05.36	15.27
19/12	05.28	15.19	21/01	05.26	15.17	23/02	05.24	15.15
20/12	05.16	15.07	22/01	05.14	15.05	24/02	05.12	15.03
21/12	05.03	14.54	23/01	05.01	14.52	25/02	04.59	14.50
22/12	04.51	14.42	24/01	04.49	14.40	26/02	04.47	14.38
23/12	04.38	14.29	25/01	04.37	16.10	27/02	04.34	16.07
24/12	04.26	15.59	26/01	04.24	15.57	28/02	04.22	15.55
25/12	04.14	15.47	27/01	04.12	15.45	01/03	05.51	15.42
26/12	05.43	15.34	28/01	05.41	15.32	02/03	05.39	15.30
27/12	05.31	15.22	29/01	05.29	15.20	03/03	05.26	15.18
28/12	05.18	15.09	30/01	05.16	15.07	04/03	05.14	15.05
29/12	05.06	14.57	31/01	05.04	14.55	05/03	05.02	14.53
30/12	04.53	14.44	01/02	04.52	14.43	06/03	04.49	14.40
31/12	04.41	14.32	02/02	04.39	16.12	07/03	04.37	16.10
01/01	04.29	16.02	03/02	04.27	16.00	08/03	04.24	15.57
02/01	04.16	15.49	04/02	04.14	15.47	09/03	05.54	15.45
03/01	04.04	15.37	05/02	05.44	15.35	10/03	05.41	15.32
04/01	05.33	15.24	06/02	05.31	15.22	11/03	05.29	15.20
05/01	05.21	15.12	07/02	05.19	15.10	12/03	05.17	15.08
06/01	05.09	15.00	08/02	05.07	14.58	13/03	05.04	14.55
07/01	04.56	14.47	09/02	04.54	14.45	14/03	04.52	14.43
08/01	04.44	14.35	10/02	04.42	16.15	15/03	04.39	16.12
09/01	04.31	16.04	11/02	04.29	16.02	16/03	04.27	16.00
10/01	04.19	15.52	12/02	04.17	15.50	17/03	04.14	15.47
11/01	04.06	15.39	13/02	05.46	15.37	18/03	05.44	15.35
12/01	05.36	15.27	14/02	05.34	15.25	19/03	05.31	15.22

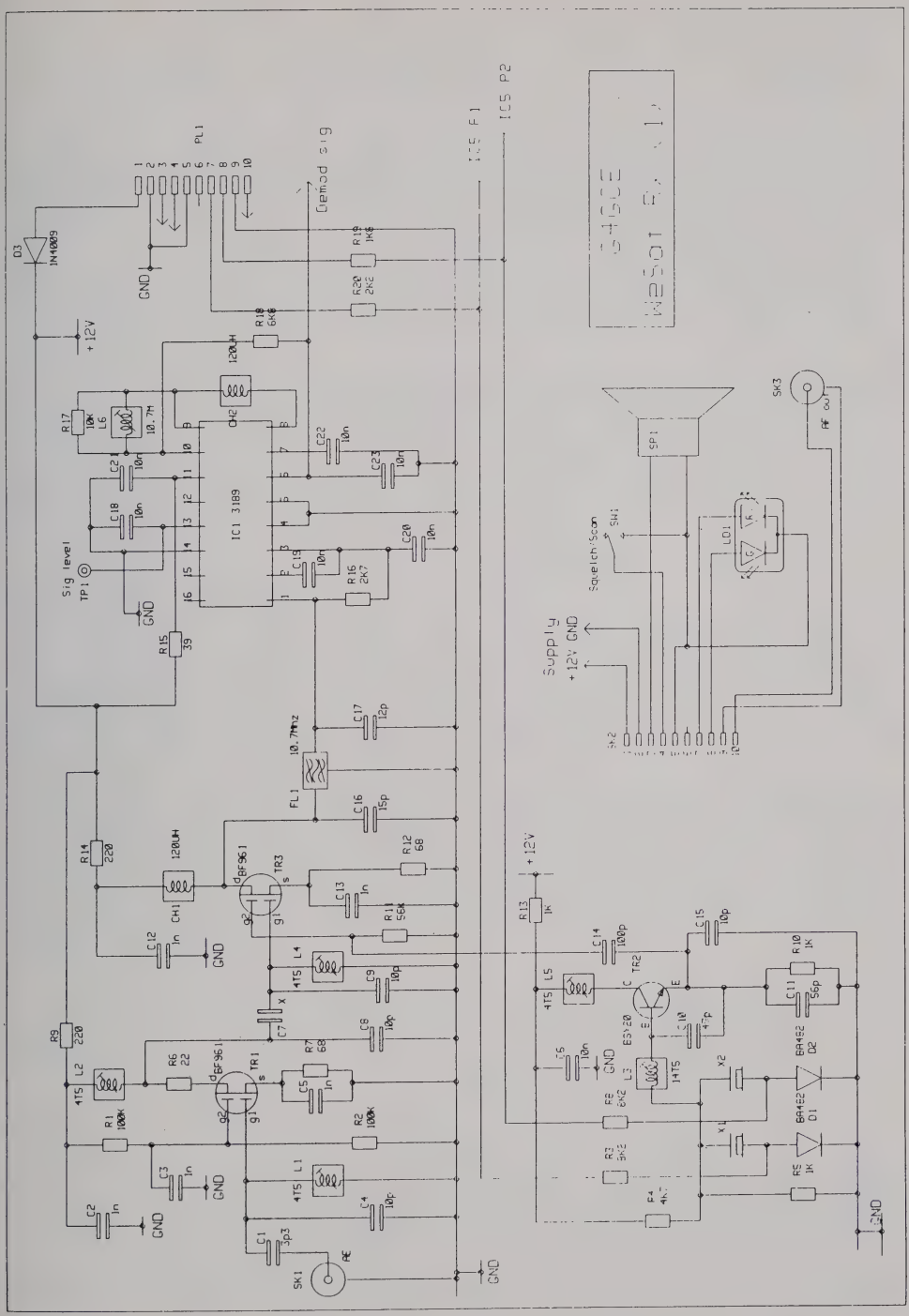
MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

NOAA 12 PERIOD 101.28 MINS FREQUENCY 137.50MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

11/12	07.40	19.08	13/01	07.20	18.48	15/02	08.37	18.24
12/12	07.18	18.46	14/01	08.39	18.26	16/02	08.15	18.02
13/12	08.37	18.24	15/01	08.17	18.04	17/02	07.52	17.39
14/12	08.15	18.02	16/01	07.55	17.42	18/02	07.30	18.58
15/12	07.53	17.40	17/01	07.33	19.01	19/02	07.08	18.36
16/12	07.31	18.59	18/01	07.11	18.39	20/02	08.27	18.14
17/12	07.09	18.37	19/01	08.30	18.17	21/02	08.05	17.52
18/12	08.28	18.15	20/01	08.07	17.55	22/02	07.42	19.11
19/12	08.06	17.53	21/01	07.45	19.14	23/02	07.20	18.48
20/12	07.44	19.13	22/01	07.23	18.51	24/02	08.39	18.26
21/12	07.22	18.51	23/01	08.42	18.29	25/02	08.17	18.04
22/12	08.41	18.28	24/01	08.20	18.07	26/02	07.54	17.41
23/12	08.19	18.06	25/01	07.58	17.45	27/02	07.32	19.00
24/12	07.57	17.44	26/01	07.36	19.04	28/02	07.10	18.38
25/12	07.35	19.04	27/01	07.13	18.42	01/03	08.28	18.15
26/12	07.13	18.41	28/01	08.32	18.20	02/03	08.06	17.53
27/12	08.32	18.19	29/01	08.10	17.57	03/03	07.44	19.12
28/12	08.10	17.57	30/01	07.48	19.16	04/03	07.21	18.50
29/12	07.48	19.16	31/01	07.26	18.54	05/03	08.40	18.27
30/12	07.26	18.54	01/02	08.45	18.32	06/03	08.18	18.05
31/12	08.45	18.32	02/02	08.23	18.10	07/03	07.56	17.43
01/01	08.23	18.10	03/02	08.00	17.47	08/03	07.33	19.02
02/01	08.01	17.48	04/02	07.38	19.06	09/03	07.11	18.39
03/01	07.39	19.07	05/02	07.16	18.44	10/03	08.30	18.17
04/01	07.17	18.45	06/02	08.35	18.22	11/03	08.07	17.54
05/01	08.36	18.23	07/02	08.13	18.00	12/03	07.45	19.13
06/01	08.14	18.01	08/02	07.50	17.37	13/03	07.23	18.51
07/01	07.52	17.39	09/02	07.28	18.56	14/03	08.41	18.28
08/01	07.30	18.58	10/02	07.06	18.34	15/03	08.19	18.06
09/01	07.07	18.36	11/02	08.25	18.12	16/03	07.57	17.44
10/01	08.27	18.14	12/02	08.03	17.50	17/03	07.34	19.03
11/01	08.04	17.51	13/02	07.40	19.09	18/03	07.12	18.40
12/01	07.42	19.11	14/02	07.18	18.46	19/03	08.31	18.18

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND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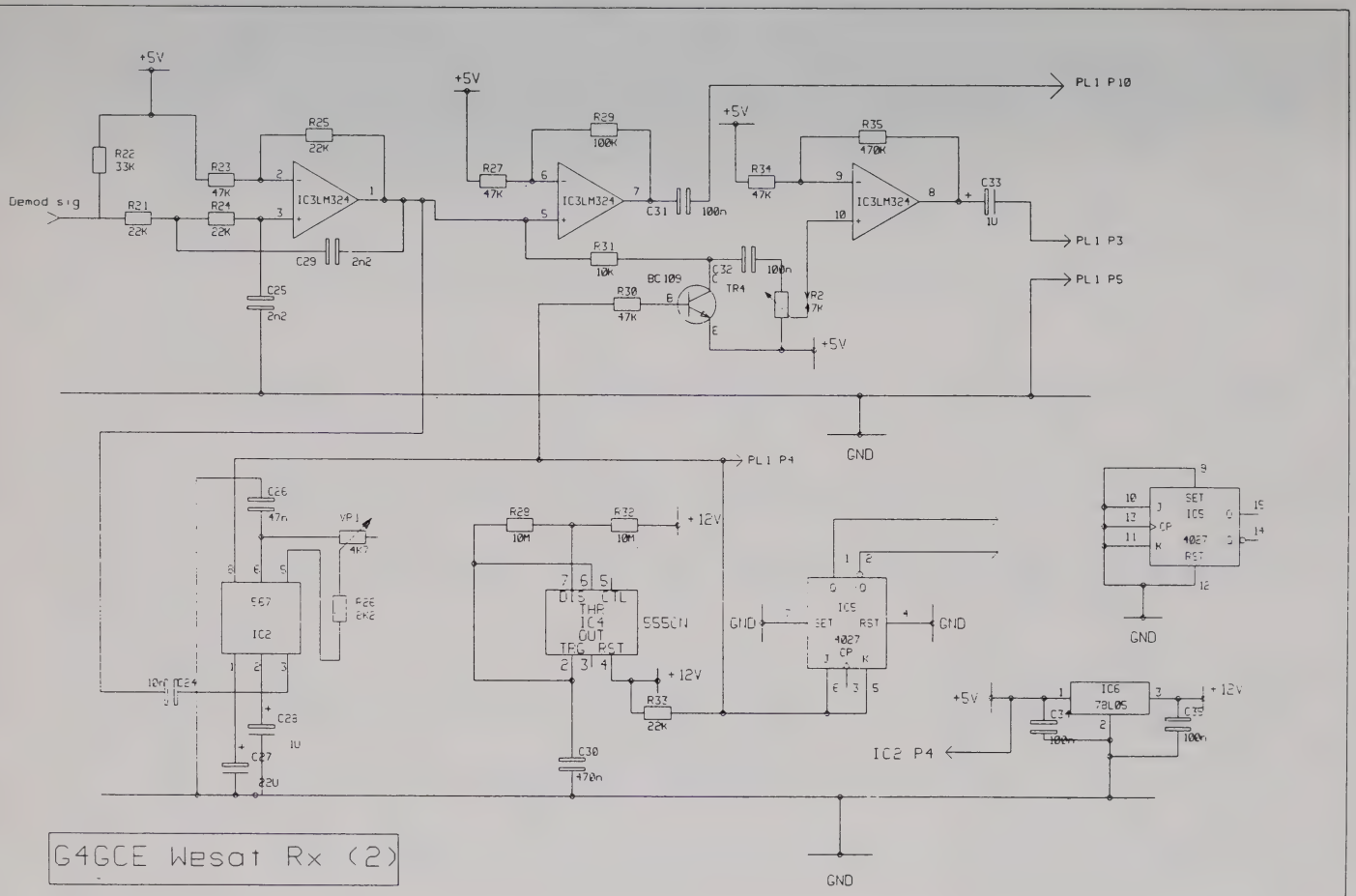
IC1 3189
Sig level
Squelch/Scan
Supply
+12V GND
AF out
GND
+12V


+5V
R22 33K
R23 47K
R25 22K
Demod sig
R21 22K
R24 22K
IC3LM324
C29 2n2
C25 2n2
R27 47K
R29 100K
C31 100n
R34 47K
R35 470K
C33 1U
PL1 P10
PL1 P3
PL1 P5
R31 10K
C32 100n
BC109
TR1
R30 47K
VR2 47K
GND
PL1 P4
C26 47n
VR1 4K7
IC2 555
R28 10M
R32 10M
+12V
DIS CTL
THR
IC4
OUT
TRG RST
555CN
R33 22K
C30 470n
IC5 4027
SET
CP
RST
IC2 P4
IC6 78L05
C34 100n
C35 100n
C27 22U
C28 1U
G4GCE Wesat Rx (2)

(TR2), enough to ensure good strong-signal handling. It uses overtone (5th) crystals of one third of the LO output frequency. For the NOAA frequencies the crystals are 42.267 MHz and 42.307 MHz, switched by diodes D1 and D2.

Because the IF filter (FL1) is high impedance it is driven directly from the mixer drain. The output resistance of the mixer together with choke CH1 and capacitor C16 provide the correct source impedance to the filter.

IC1 is a device intended for broadcast FM and has a sensitivity of a few microvolts, excellent signal/noise ratio, a signal-level output which is approximately logarithmic, tuning meter output and a low-distortion demodulator. All for 98p!

The values of the components associated with the discriminator have been optimised for the narrower deviation of this application. It is a consequence of the high ratio of IF to deviation that alignment of the quadrature discriminator tank (L6) is rather critical. The best method it to use a sweep generator but if one is not available it can be set with an actual transmission.

LF processing and channel scanning.

The signal from the demodulator is low-pass filtered by the first section of IC3, a quad operational amplifier. Another section forms a buffer and amplifies the signal to a suitable level for output, a third drives a monitoring speaker which can be either a high impedance moving coil type or a piezo crystal unit. Monitoring volume level is set by VR2.

A phase-locked-loop decoder chip (IC2) detects the presence of the 2.4 kHz sub-carrier contained in a valid signal. The output at pin 8 mutes/unmutes the monitoring audio in the absence of such a signal via TR4 and enables/inhibits channel scanning. The reference frequency oscillator is set by VR1 - its output, when locked, could be used to synchronise an A to D converter for further digital signal processing.

Timer IC4 clocks the JK bistable IC5 to alternate between the two channels via switching diodes D1 and D2. A red/green LED identifies which channel is operational.

Construction and component suppliers.

The prototypes are constructed on double sided PCBs of about 12cm x 8cm using point-to-point wiring. All parts except for the filter are supplied in the UK from either Cirkit or Maplin. The filter is available from Henry Neale for £4.00 including post and packing.

DIY PICTURE RECEPTION - A QUICK GUIDE.

Mark Pepper.

A variety of people are interested in the reception of images from satellites; those interested in meteorology and those interested in the technology. Equally there are many types of equipment that cater for their interests, the plug in and go and the build it yourself. I am a constructor, therefore, this article looks at the DIY approach to satellite picture reception.

The Timestep/OFS/ICS systems undoubtedly produce excellent pictures, however, for the constructor they don't provide much in the way of a challenge. Just plug them in and voila, instant weather pictures, then what? Doing it yourself can provide a system that is more flexible and is infinitely more rewarding. You may already have many of the components needed for the system that you can utilise etc, but be warned it can quite easily cost you more because you just won't be able stop adding that extra little gadget.

The system I will describe is based around a PC because of its availability and because, to be honest, I've got one. The system consists of three main sections, the receiver system, the PC interface and the PC based software. This last area is possibly the only area which would be different on a non PC based system. The interface section converts the receiver's audio output to a parallel data stream that can be connected to almost any computer system.

There are many receiver systems available, I chose the Cirkit MK2 receiver because it was cheap, available and more importantly, I could buy it as a kit. Construction is quite straight forward for the practised hobbyist, and should alignment prove a problem Cirkit will align a properly constructed board for around £8. They will even fix it if it doesn't work, for a fee. They also sell a constructed and aligned board for the less adventurous, leaving the PSU etc to be made separately. The receiver is crystal/channel based and can quite easily be modified. For example I have a small front end that enables scanning to be automatic or manual under push button control. It displays the selected channel on a seven segment LED, allows the missing out of selected channels, triggers my tape recorder only when a 2.4kHz tone is present and provides a signal strength meter (see RIG 2, 23 & 25). Maybe this could be made into a short construction article at a later date should people be interested.

The receiver accepts a standard 50ohm input from aerials such as the Cirkit crossed dipole or the output from the RIG down converter. There is even provision for providing power to a pre-amp or the down converter via the coax. I use the RIG down converter and a TH2 loop Yagi (designed by Henry Neale). Construction of an aerial system really depends on the users requirements and ability at metalworking. Cheap kits for both crossed dipoles, loop yagis and dishes are now readily available but should you wish to go it on your own I can recommend both Ralph Taggart's 'Weather Satellite Handbook' and Martin Davidoff's 'The Satellite Experimenter's Handbook'

both for the construction and theory of operation of suitable aerials. The down converter is a 'buy the box' situation though, due to the precision needed with microwave circuitry.

The interface between the receiver and the computer is simply a glorified analogue to digital converter. The audio signal is taken from the receiver, buffered, filtered, rectified and then converted to digital with an A/D converter. The digital data is then presented to your computer for the software to 'decode' into pictures. The construction of an interface should not give any problems. Designs suitable for veroboard construction have been published in RIG before (if you are a new comer to RIG, like me, take my advice and invest in all the back issues), a simple interface can be purchased and expanded or the circuit provided with the software, detailed later, can be used as a guide. I use an interface kit produced by Pixel Plus Developments. This interface is basically the same core circuit as the Cirkit and Maplin interfaces but has the advantage of being supplied with some basic software for displaying Meteosat and low orbiting satellite pictures on the PC, and its cheap. The interface has white and black level controls as well as a 2.4kHz phase locked loop for doppler shift locking. The kit also lends itself to modification. Such things as audio amps and bar graph displays are easily added.

When it comes to software I have found only one piece of software that is worth consideration. JVFAX (now at V6.0) is a piece of shareware (registration involves sending a gratuity of your choice) that supports the reception of AM and FM FAX as well as colour SSTV and FAX transmission. It is available on the RIG BBS as files JVFAX60.ZIP and JVFDIAG.ZIP. The documentation supplied with the software gives circuit details of an all singing all dancing AM/FM/SSTV interface, a very simple but effective FM demodulator (see fig1) for HF FAX and a FAX transmission modulator. The software supports automatic picture transmission (APT) reception, timed and squelch controlled picture acquisition as well as animation and FAX transmission. Data can be fed to the program using the serial port in a type of parallel mode (see later), a comparator connected into the serial interface (see figure 1), an 8 bit

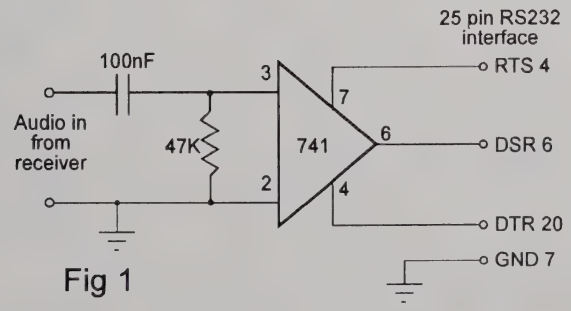


Fig 1

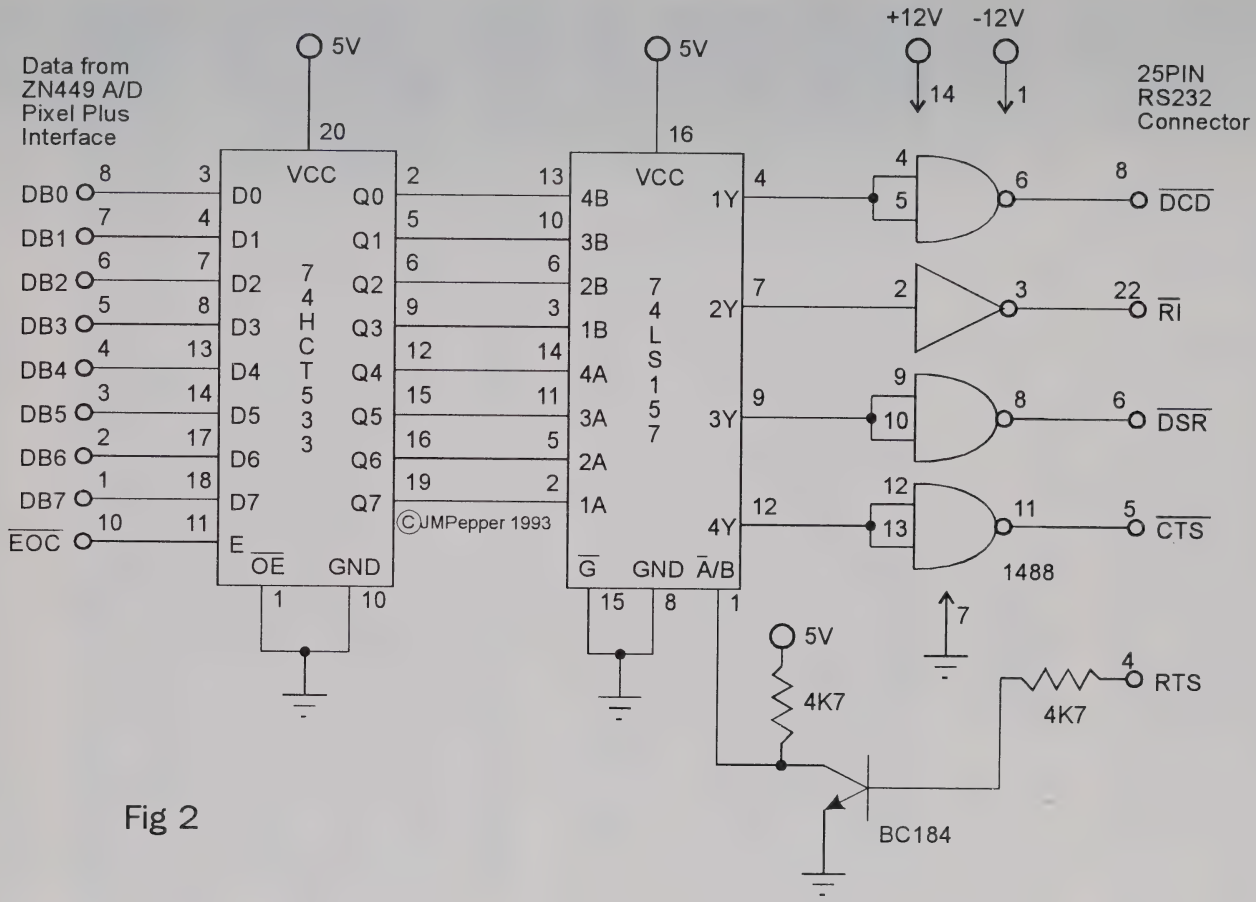

Data from
ZN449 A/D
Pixel Plus
Interface
5V
20
VCC
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
EOC
D0
D1
D2
D3
D4
D5
D6
D7
E
OE
GND
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
74HCT533
©JMPepper 1993
5V
16
VCC
4B
3B
2B
1B
4A
3A
2A
1A
G
GND
A/B
1Y
2Y
3Y
4Y
74LS157
+12V
-12V
14
1
25PIN
RS232
Connector
DCD
RI
DSR
CTS
1488
5V
4K7
4K7
RTS
BC184

Fig 2

parallel input port or one of three commercially available interface boards (A+M, MEFAX & Faxellite). Output to your monitor can be from the splendidly psychedelic 4 colour CGA to 1024x768x256 colour SVGA. JVFAX also saves pictures in GIF or TIF formats, allows the editing of picture alignment, orientation and artificial colouration. Finally, full support is given to printing on laser printers plus 9 and 24 pin dot matrix printers either directly or by the configuring of a few simple control codes. You can even re-configure the printed grayscales. OK, so I must admit I work for a printer manufacturer, but I think Timestep could possibly improve the printing and file save areas of their software; enough said. The serial port in parallel mode uses four input pins (DCD, RI, DSR and CTS) and one output (RTS) on the RS232 port as an 4/8 bit input port. The output pin being used to multiplex the MSB and LSB bits of the A/D output into the program. Figure 2 shows a simple circuit that will allow the connection of any 8 bit A/D converter output to JVFAX. I use it very successfully with the Pixel Plus interface described above.

Connect the aerial system, whether low orbiter or Meteosat, to the receiver, the receiver to the interface and the interface to the computer. Run the software and after some knob and configuration twiddling you should be getting very respectable weather pictures. With the system I've described you can also get HF FAX transmissions and animate frames from Meteosat such as the classic D2 Europe pictures as seen on TV. The results obtainable from the above system are very comparable to those obtained from the Timestep system which I also use, especially when the outputs from their print routines are compared. I have included some sample Meteosat D2 pictures, for you to compare (Figs 3 & 4). However, the biggest thrill has got to be had from the learning of all the relevant technical details and watching the theory come together into a working system, I was bored with the Timestep system within days but I still wake up in the middle of the night with ideas of what I can add to my home made system next.

Just to finish, some very rough costings:

My Meteosat/Noaa/Meteor system		
Crossed dipole	£20	
Cirkit Pre-amp	£5	
Cirkit Receiver kit	£50	
Extra crystals for Meteors	£15	
Loop yagi	£70	Meteosat only
Down converter	£150	Meteosat only
Receiver PSU/Box/wire etc	£20	
Pixel Plus interface	£50	
Miscellaneous circuitry	£20	
JVFAX	£0	Gratuities to Mr Backeshoff

Totals - Noaa & Meteors only £180, Meteosat, Noaa & Meteors £400
Then of cause you have the PC of your choice.

Fig.3 Image produced with JVFAX v.6.0

Fig.4 Image produced with ProsatII

References:
Pixel Plus Developments. Nailstone, Nuneaton,
Warks. CV13 0PZ. 0530 62565
JVFAX documentation. JVFAX V5.1 E Backeshoff
Weather Satellite Handbook, Ralph Taggart
The Satelite Experimenter's Handbook, David Davidoff
Rig issues 2, 8-32

INFO...

THE CD GUIDE TO ERG-1. There has recently been released a Guide to the ERG satellite on CD rom. It will run on any 386/486 PC with Windows 3.0 or 3.1, with Multimedia Extension, and of course a CD rom drive. The other requirements are a minimum of 4Mb RAM (6Mb of free virtual memory required), a minimum of 5.3Mb hard disk space (optimum 72Mb to run entire program from hard drive), and an 8 bit, 256 col (Super VGA) or 16 colour Video card with monitor to suit.

There is a quick "Highlights" program which takes around 5 minutes, and another called "Overview" which allows you to select areas for further study. In addition there is the "ERG-1 Manual" which provides more technical information. There are around 136 .BMP files containing illustrations, charts, and many actual ERG-1 image files. (These are easily browsed via VPIC, or any similar viewing program handling .BMP files). This is a must for anyone interested in imaging, with a CD Rom Drive and the appropriate computer set-up. The CD also contains the programs for Apple Mackintosh and Sun Workstation users. It comes with a small neat instruction manual.

To obtain your copy send a Cheque for 25 DUTCH GUILDERS (around £9.00) made out to...
ERG Publications Division, PO BOX 299, 2200 AG Noordwijk, The Netherlands.

FOR SALE...

YU3 UMV Framestore. Built and finished to a professional standard. Plus A-D module. Circuits included. Also 12" monitor £200.00 Prefer buyer to collect.
John Wills, 20 Pemberton Gardens, Chadwell Heath, ROMFORD, Essex. RM6 6SH
Tel: 081 590 5275

METEOSAT VIA 46 MHz

Barry Haines

Introduction:

My VHF and SHF loop yagi are mounted outside the garden shed with the Meteosat down-converter inside. The 137MHz is feed to the receiver in the house by a 100ft length of coax. Changing between orbital satellites and Meteosat required a walk to the shed. When I acquired a DAT recorder this opened up the possibility of recording the orbital satellites while collecting data from Meteosat. As I would require another receiver, I considered the idea to down converting meteosat to a lower frequency and use the same feeder thus reducing feeder costs.

137/46MHz Converter:

This is a basic design consisting of a colpitts crystal oscillator feeding gate 2 of a dual gate mosfet mixer and the 137MHz is connected to gate 1. The 46MHZ IF is passed to a mosfet amplifier but you may not need this stage if your converter has a high gain. I have specified a 91MHz crystal but any in the range 90-120MHZ should do. If you cant find a cheap source in this range then go for the 116MHZ as this is mass produced for the amateur market.

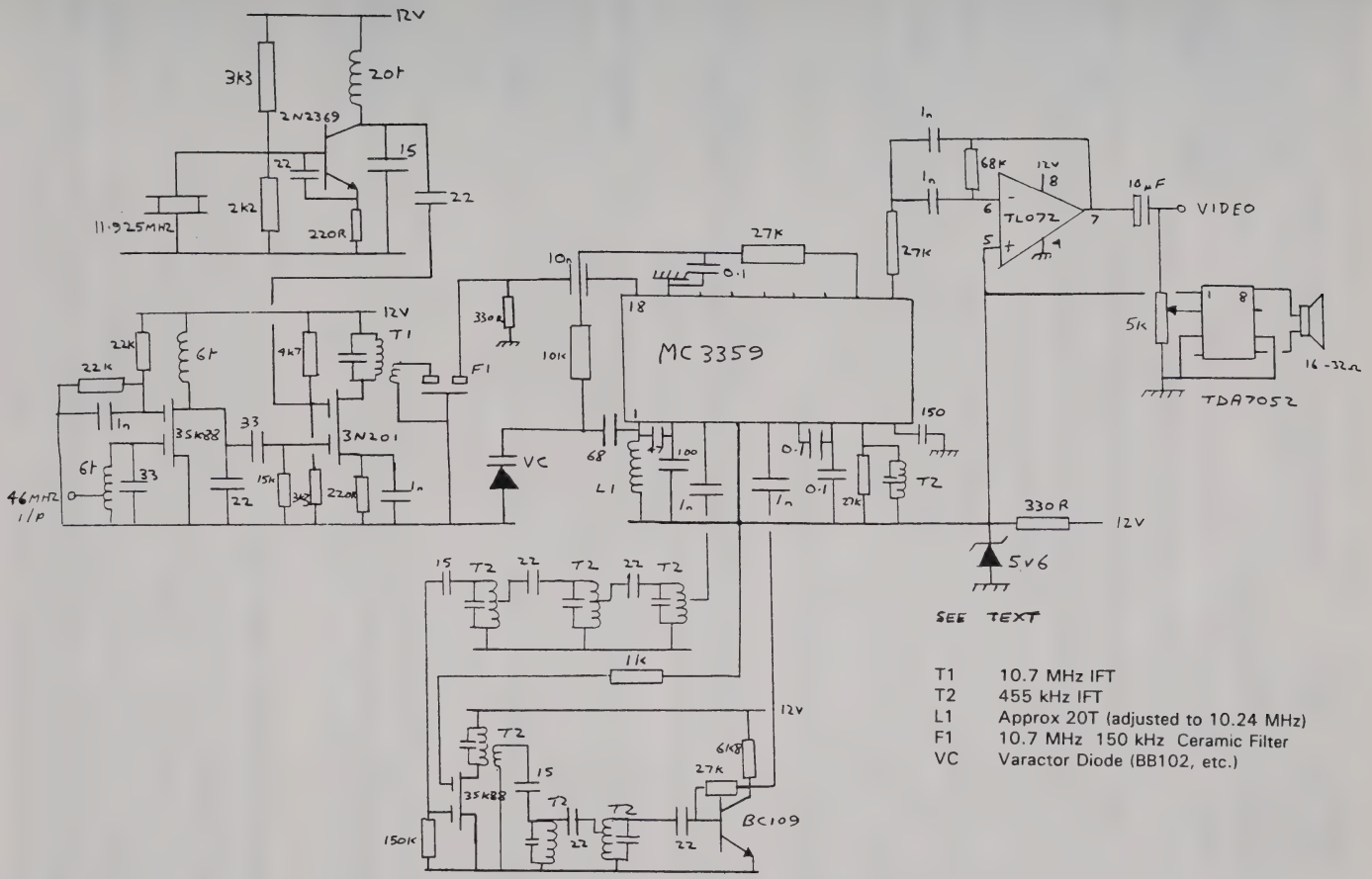
46MHz Receiver:

This consists of a mosfet amplifier feeding a mosfet mixer with the LO derived from a colpitts crystal oscillator operating in the 36MHz range. The 10.7MHz IF is passed via a 150kHz bandwidth ceramic filter to the MC3359 FM I.C. Instead of dangling the usual 10.24MHz crystal to mix to 455kHz I have used a varactor tuned LC circuit connected to the AFC pin. This has the advantage of reducing costs plus overcoming the problem of switch-on drift. The 455kHz passes through a triple tuned circuit to a mosfet amp and then a further three tuned circuits to a bipolar amplifier to improve limiting. This overkill has been adopted in case the problems METEOSAT-3 suffered arise in the future. The recovered video passes through a bi-phase op-amp filter to the output and a small half watt audio amp is included for monitoring.

Comments:

All the RF coils including L1 are wound on a 1/4" former with slug tuning. If you use a crystal other than 91MHz then small adjustments to the coils may be required. I used a 11.925MHz crystal operating on its third harmonic as I already had this in the junk box. I would recommend a visit to a radio rally with a calculator as you may find some very cheap crystals that will do the job. T1 is a HI/LO impedance 10.7MHz IFT and T2 were cheap 465kHz IFT's obtained at a rally. If you don't have access to test equipment I would recommend you use a mosfet amp with a single IFT on the input & output (shunted with a 6k8 resistor for bandwidth) between pins 3 & 5 instead of the triple tuned circuit. If all goes well the receiver should fully limit around 3uV and track any drift by about 100kHz.

137/46 MHz CONVERTER



T1 10.7 MHz IFT
T2 455 kHz IFT
L1 Approx 20T (adjusted to 10.24 MHz)
F1 10.7 MHz 150 kHz Ceramic Filter
VC Varactor Diode (BB102, etc.)

THE RIG GIF LIBRARY

PETER WAKELIN

The images currently available are unchanged from those listed on page 62 of the September Journal. A new procedure has been introduced for the despatch of GIF images with immediate effect. The procedure for obtaining shareware disks from Les Hamilton remains unchanged.

RIG now provides disks, packaging and postage on receipt of a small payment which is the same for all orders, world-wide. The cost is £2 for the first disk and £1 for each additional disk with no limit to the number ordered. MAIL ORDER ONLY. 1.44Mb HD 3.5 INCH DISKS ONLY.

HERE'S HOW TO OBTAIN YOUR DISKS.

UK members: Cheque or postal order made payable to Remote Imaging Group and sent to **Peter Wakelin, 1 Charters Road, ASCOT, Berkshire, SL5 9QF.** There is no credit card service for members in the UK.

Other members: Bank Draft (in Sterling and drawn on a UK London-based bank) or Eurocheque made payable to Remote Imaging Group and sent to Peter Wakelin at the above address. Overseas members may prefer to pay by credit card in which case orders (with a 3% surcharge) should be sent BY MAIL to Mark Clarke, 9 Park Lane, Bulmer Tye, Sudbury, Suffolk, CO10 7EQ, UK.

Additional images are always welcomed for the library. Our members outside Europe are especially invited to send images of their parts of the world. A short text accompanying images would be appreciated. Please send images to Peter Wakelin at the address above.

IMAGE PRINTING SERVICE

The possibility of introducing a printing service for members is under consideration. It is envisaged that members would submit images on disk for printing on a laser printer at not less than 600 dpi resolution. The cost and logistics of the operation have yet to be determined but if you would be interested in such a service then please answer the relevant question on the membership survey form which appears elsewhere in this issue. Constructive comments may be added if desired.

SHAREWARE CORNER

LES HAMILTON

Since Shareware Corner first appeared in the pages of RIG way back in late 1991, the library of useful shareware has continually increased. So much so that a radical re-organisation is now needed if it is to continue to meet the best interests of RIG members. Particularly, as an increasing quantity of shareware has become available, it now seems sensible to re-organise the discs on a category basis. For the present, I have introduced the following seven categories:-

[A-01 . . .] ASTRONOMY
The ASTRONOMY offerings are generally planetarium-type programs, not necessarily directly related to Remote Imaging, though some should provide more than a passing interest in that they also superimpose satellite tracks across the starfields.

[C-01 . . .] COMMUNICATIONS (MODEMS etc.)
Software specific to Remote Imaging, modems etc.

[F-01 . . .] IMAGE FORMAT CONVERSION
The programs on these discs handle large-scale image alteration, such as joining images together, cropping, converting between GIF/PCX/TIFF, etc.

[I-01 . . .] IMAGE PROCESSING
These offerings involve image alteration right down to the pixel level, such as removing "noise" in the form of black or white dots, image dithering prior to printing, and file conversion.

[T-01 . . .] TRACKING AND PREDICTION SOFTWARE
Self explanatory. Generally, all these offerings either manipulate keplerian elements, or use them to create a display of satellite tracks over Earth maps.

[U-01 . . .] UTILITIES
These programs have generally little intrinsically to do with Remote Imaging per se, but can be viewed as means to ends. These utilities include, amongst others, screen capture, image dithering (for printing), remote control by computer etc . . .

[V-01 . . .] VIEWING UTILITIES
These are probably the most used programs of all, providing the means by which .GIF images are viewed on the microcomputer, though some also include image manipulation facilities.

By organising the Shareware Library in this way, I see two advantages. Firstly, RIG members with a particular interest in the shareware field should be able to acquire all the relevent software they need without having to send so many discs for copying, thus saving on post and packaging. And secondly, I will, hopefully, save time on disc duplication, providing a more efficient service.

Self-extracting archives... A further change is the mode of archiving the software. Originally, programs were supplied as zipped archives, and PKUNZIP had to be included on each disc to expand them. By using LHA to create self-extracting .EXE archives, PKUNZIP is no longer required, freeing additional disc space. Generally, these self-extracting files are also somewhat smaller than their zipped counterparts.

For those of you unsure how to deal with these self-extracting files, expanding is simplicity itself, and can be broken into three stages.

1. Create a directory on your hard disc, and copy the archive into it
2. Double-click on the archive to expand it (or simply type the filename if working from the DOS prompt).
3. Delete the original archive file from this directory.

That's all there is to it !

And finally . . . In the short term (the next couple of RIG Journals or so), I will maintain the "99" series of Shareware Discs so as to cater for those ordering from earlier issues. However, it is my intention, within the ensuing 12 months, to discontinue these, as they are no longer adequate to maintain the quantity of shareware currently becoming available.

SHAREWARE REVIEWS...

As always, I am always on the look-out for useful shareware. RIG members coming across any good shareware that has not appeared in the Library are encouraged to send me copies (accompanied, if desired, by a short review / evaluation of its functions and capabilities).

The RIG 34 Shareware Review certainly seems to have generated a lot of interest, particularly RIGHTIME, with 70 shareware requests in the two weeks following publication. There have been reports of a problem with RIGHTIME, generating a runtime error with DAT2PA2. If you have a fix for this, please write in and let me know.

Shareware requests seem to be falling into two fairly well defined categories, those for the complete set, and those for discs carrying the reviewed shareware. Accordingly, as an experiment, I will be offering, additionally, the reviewed shareware as a compilation on two RIG 35 discs, till the end of February only.

VPIC v 6.0
If version 5.0 of VPIC works well for you, then you have probably no need to go for this latest upgrade. Almost identical with its predecessor, VPIC v 6.0 autodetects a VESA compatible card, if you have one. If not, and this is the main improvement over VPIC v 5.0, there is a large selection of VESA TSR routines for most of the most popular video cards. If you were having problems viewing files with version 5.0, then VPIC 6.0 is definitely worth trying - otherwise, it really offers little in the way of enhancements. VPIC v 6.0 comes as the file VPIC60.ZIP, and PKUNZIP is included to expand all its files. VPIC60.ZIP can be found on Disc V-01.

GSIP v 1.0
GSIP is something a little bit different, but a program some of the more adventurous RIG members might like to dabble with. Its acronym stands for GREY SCALE IMAGE PROCESSOR, and it offers a relatively easy introduction to manipulative features such as image mirroring, rotation, size reduction, greyscale inversion, and enhancement through several filtering techniques. It is possible to re-map the greyscale, remove black spots and fill white ones, apply histogram equalisation, edge enhancement, average and blurring filters, and perform individual pixel editing. There are image dithering facilities to give optimum printouts on both dot-matrix and HP laser printers. GSIP comes with a concise nine page documentation file, and is really easy to use, as all features are accessed through a slick pull-down menu system, even though it is not a windows application. Also, there is no mention of any need to register the software.

You must by now be wondering what I meant by stating at the outset that this was a program for the more adventurous. Well, it does not handle GIF format images. GSIP only recognises .PCX image files. But don't give up - this is no problem at all. Go back to your trusted VPIC, and load your GIF image (let's call it PICTURE.GIF). With this image on screen, press the [Z] key. You will see the message "Do you want to convert to PCX" at the top of the screen. Just press the [Y] key, and a new file PICTURE.PCX is created. This file must now be copied into the GSIP directory (GSIP does not access outside directories), where you can work on it. When you are happy with your results, use GSIP to save the new version of PICTURE.PCX.

Finally, transfer a copy of this modified version of PICTURE.PCX back into the VPIC directory, and view it. This time, with the image on screen, press the [G] key. The question you are asked is "Do you want to convert to GIF". Press the [Y] key, and at the following prompt, either opt to save under a new name, or overwrite the old version of PICTURE.GIF. If you think this is complicated, try it and see. You will be amazed at how easy it all is! GSIP is to be found on Disc I-02.

SCREEN THIEF V 1.0
Screen Thief must be the best screen-capture utility for the PC to date. If you

have found VGA CAPTURE V 8.0 wanting (it does not work at all on my 486!), then this is the program for you. Screen Thief has been designed to capture every conceivable video mode, including non-standard ones, no matter which VGA adaptor you use. The program runs on 286's and better, is memory resident, claiming just a paltry 2K of your system, and is activated by the Ctrl-Alt-T hot-key combination. By default, it outputs GIF files, though it can also be configured for PCX, BMP and TIFF. Screen Thief can be registered with Nildram Software of Tring, Herts for £34. The evaluation copy can be found on Disc U-02

SKYMAP V 4.5
This is a program which generates star-maps, upon which satellite trajectories can be superimposed. It should prove interesting to RIG members keen on visual "satellite spotting" on clear, dark evenings. Skymap can generate star-maps in three formats, stereographic, rectangular and polar. In all cases, the field of view can be pre-defined. Stars can be generated from two datafiles, one with stars up to magnitude 6 (5000 of them) and the other going up to magnitude 6.5 (9000 stars). Additionally, there is the option to define a more restricted range of stellar magnitudes for display. Also provided is the option to add names of brighter stars, and planets to the maps. Lines of longitude and latitude may be added to the maps, in user defined increments.

Satellite data is read from standard NASA 2-line element files. In practice, I find it best to use a text editor to create files containing just one satellite, otherwise, the maps do become rather cluttered with tracks. So you can have NOAA11.TXT, MET303.TXT and so on. This is the simplest way to ensure the map shows clearly the path of the named satellite. Points along the satellite's track are plotted at user-defined intervals, and tick marks can be added, again at preferred intervals (e.g. 20 seconds, 30 seconds etc.).

SKYMAP is not a full planetarium simulator, and does not show constellation outlines or boundaries (like SKYGLOBE and STARWARE), but will no doubt provide hours of entertainment on cold winter evenings. SKYMAP is on Disc A-01.

TIMESET V 7.1
Timeset is a utility that enables you to set your computer's clock by accessing any one of five atomic clocks by telephone. For European users, there are three such clocks available, in Sweden, Austria and Italy. The program has been designed to interact closely with RIGHTIME (see RIG 33), and can be found on Disc U-01.

DSZ V 2201
If you regularly download files from Bulletin Boards you might wish to investigate DSZ, a protocol driver for transferring files over the serial port. Implementing the ZMODEM file transfer protocol, DSZ includes two levels of intelligent crash recovery. DSZ is on Disc C-01.

UPGRADE NEWS

NEOPAINT is now in version 2.1d. If you have experienced difficulty working in 256 colour modes (Trident 8900 graphic card users certainly have!), your problems are over. This version now operates beautifully.
JVFAX V 6.0 is now available (v5.2 reviewed RIG 34 pp 34-5) on Disc C-01.

RIG 35 DISC

For members interested only in the reviewed shareware, Disc RIG 35 (a 2-disc set this quarter) will be available during the months of December-February. Thereafter these items will only be available by ordering separate Shareware Library Discs.

HOW TO GET YOUR COPIES OF THE RIG SHAREWARE LIBRARY...

SEND UP TO 6 PC-FORMATTED BLANK DISKS (3.5" 1.4Mb ONLY)
IN A STURDY RESEALABLE PACKAGE (or a package within a package)
(Jiffy Bags are ideal and can be reused many times)
A SELF ADDRESSED STICKY LABEL
STAMPS FOR THE RETURN POSTAGE
STAMPS OR COINS TO THE VALUE OF £2.00 (UK ONLY)
(OVERSEAS MEMBERS RETURN POSTAGE IS FREE).

Please send all new and updated versions of Shareware, etc. direct to Les.
All enquiries regarding Shareware to Les (Letters only!); answered by return.

THE ARCHIMEDES PICTURE LIBRARY

All the Picture Disks 1 to 34 are available for the Archimedes (for list see RIG34).

How to obtain Archimedes Images...
The same rules apply as those for the Shareware Library
Please send only 800kb 'E' formatted DS/DD discs.
(All machines can format to 800kb on DS/DD discs)
Note Library disks Nos. 26, 27 and 30 will require two 800kb disks each to get all the converted files on.

If you have any !Framestore discs which you have created, please feel free to send a copy, to Les Hamilton for evaluation.

RIG SHAREWARE LIBRARY — Viewing/tracking progs etc. PC only !

Disc A-01	SKYMAP V 4.5 (plots satellite tracks on starfields) STARWARE V 3.2 (Planetarium simulator) SKYGLOBE (Planetarium simulator)
Disc C-01	DSZ2201 (ZMODEM protocol driver) JVFAX V 6.0 (APT, FAX, WEEFAX etc. receiving program)
Disc F-01	CUT-NOAA (trimming program for large .NOA files) DAT2PA2 (Meteosat .DAT to .PA2 conversion program) JOIN-PIX (Joins Prosat II CO2 and CO3 images together) NOATIFF V 3.0 (Converts .DAT, .NOA , and RAW files to TIFF)
Disc I-01	GRAPHICS WORKSHOP V 6.1 (View / dither / print. for GIF etc.) IMAGE PROCESS V 1.0 (GIF editing program) IMAGE PROCESS V 4.0 (GIF editing program) IMAGE DISPLAY V 7.9 (GIF viewing and enhancing program) PAINTSHOP (Windows view / enhance / print prog for GIF) WINGIF (Windows viewing / enhancing program for GIF)
Disc I-02	GSIP (PCX image viewer / enhancing program) GWSWIN11 (Graphics workshop for Windows) NEOPAINT V 2.1d (GIF,PCX, TIF viewer / editor / paint program)
Disc T-01	PCTrack V 1.1 (Satellite tracking program - simple to use) PCTrack V 2.41 (Latest version - uses 2-line keplers) STSORBITPLUS V 9320 (Superb satellite tracking program) TRAKSAT V 2.75 (Satellite tracking and data tabulation)
Disc T-02	AOS-TIME (Basic program to predict best sat. passes each day) EDSAT V 1.6 (program for manipulating NASA 2-line element files) ELEMENT MANAGER V 2.2a (management of NASA and Amsat files) GEOCLOCK V 2.45 (Earth map showing daylight and night areas) LEARNORBIT (teaching program about satellite orbits)
Disc U-01	DOWN (Autodown and Prodown for Prosat II) GIFDOT v 2.0 (GIF printer routine for dot-matrix printers) RIGHTIME V 2.54 (Keeps CMOS clock on time for gridding etc.) SCREEN THIEF V 1.01 (One of the best screen capture TSR's TIMESET V 7.21 (Set your computer via atomic clock) VGA CAPTURE V 8.0 (resident screen capture program) WX V 4.3 (Weather forecasting program)
Disc V-01	COMPUSHOW V 8.41 (GIF viewing program) GIFDESK V 4.0 (GIF viewer / resizer / cataloguer) GIF-REED (GIFV) (GIF viewer / enhancing program) PKUNZIP (De-archiving utility for VPIC) VPIC V 6.0 (GIF viewer / file format converter)
RIG-35A	GSIP (PCX image viewer / enhancing program) JVFAX V 5.2 (APT, FAX, WEEFAX etc. receiving program) NEOPAINT V 2.1d (GIF,PCX, TIF viewer / editor / paint program) DSZ2201 (ZMODEM protocol driver)
RIG-35B	PKUNZIP (De-archiving utility for VPIC) SCREEN THIEF V 1.01 (One of the best screen capture TSR's) SKYMAP V 4.5 (plots satellite tracks on starfields) TIMESET V 7.21 (Set your computer via atomic clock) VPIC V 6.0 (GIF viewer / file format converter)

THE SOVIET & CHINESE SCENE

PETER WAKELIN

METEOR 3-3 operated well until early September when the IR sensor developed problems similar to those experienced by METEOR 3-4 a few weeks earlier. The morning northbound visible imagery continued for a further two weeks until illumination became inadequate and it was switched off. By mid October the southbound passes had precessed into daylight and it was switched back on, this time on 137.3 MHz. The IR sensor is still inoperative but, hopefully, visible imagery will continue until early December when again illumination will become too low.

METEOR 3-4's problem reported last time continued until it was switched off in late July. I have heard nothing from it since. However, on or about 30 July it was manoeuvred into a lower orbit with the nodal period reduced from 109.38 to 108.97 minutes. It remained there for about 12 days before being raised to a 109.44 minute orbit. I do not know the reason for this manoeuvre.

Receiving orbital elements by electronic means and loading them directly in to prediction programmes is very convenient, fast and error-free but it does mean that small changes can be missed. It was Kettering Group member Len Maxim in New Zealand who first brought the manoeuvre to my attention through Geoff Perry.

METEOR 2-21 was launched on 31 August together with TEMISAT. Signals from both payloads were heard in Sweden and the UK early the following morning, soon after transmissions began. The choice of a second rather than a third series METEOR may have been governed by TEMISAT's orbital requirements. METEOR 2s operate at a lower height than the later series. Soon after launch Les Currington confirmed my suspicion that all was not well with METEOR 2-21. The signal strength was erratic, mostly very low and, at times, almost non existent. Mike Robinson of Accrington informed me of the frequency change on 30 September from 137.40 to 137.85 MHz but that did not improve the signal. It is looking increasingly unlikely that we shall see any useful imagery from this one.

Nothing has been heard from METEOR 3-5 for a very long time now so it would seem that there is now no IR imaging capability on any METEOR and that METEOR 3-3 is the only one capable of visible imagery. This, together with the demise of NOAA 13, means that there will be several weeks near the

December solstice without visible images of Europe except from METEOSAT. Let's hope that METEOR 3-6 will be up by then.

Finally, here is some information about future weather satellite activity. I am grateful to Geoff Perry and Dave Wright for making this available. Arianespace Newsletter number 81, dated October 1993 reports that the Japanese GMS 5 should be operational in 1995 and that in Russia work continues on METEOR 3M with launch scheduled for 1996/7. The suffix M has been used in the past to indicate an upgraded version of a spacecraft. Perhaps METEOR 3M is a significant enhancement of the present METEOR 3 craft but not a completely new design which would, presumably, be called METEOR 4.

Some insight into future Chinese activities came from the 21st Conference of Geostationary Meteorological Satellite Operators which was held in Beijing in April 1993. FENG YUN 2A will be the first Chinese geostationary satellite to be launched but not before February 1994. It will be positioned at 105E longitude. The next launch in the FENG YUN 1 series of polar-orbiting satellites will not be until late in the nineties. FENG YUN 1C and D will have very high resolution 10-channel radiometers.

At a staff colloquium held at the Smithsonian National Air and Space Museum in February 1992 Yanping Chen stated that FENG YUN 2A would be spin-stabilised after launch on a CZ4 rocket. She also said that its radiometer would have similar characteristics to the VISSR on the American GOES.

FOR SALE...

AMIGA 1200 with 60Meg HDD and second floppy, only a few hours use from new. £300. Purchaser to collect, or post at own risk.
K.L. Bond, 20 Hunton Bridge Hill, Hunton Bridge, Kings Langley, Herts WD4 8PU
Tel: 0923 267165

AOR 3000A scanning receiver 100kHz -2036mHz all modes, mint, all packing etc. Still under guarantee £775.00
ACEPAC3A control software (for PC) to suit - original £80.00 SSB masthead preamp 50mHz-3000mHz £110.00 and ICOM AH7000 discone £60.00 (both indoor use only).
Phone Paul Chamberlain (G4XHF) on 0293 515201 (evenings). Crawley, W. Sussex.

KEPLER ELEMENTS

SIMON GOODALL

```
NOAA9                137.62MHz
1 15427U          93290.74612187 0.00000000                          6050
2 15427  99.0870 332.9651 0014954 179.9226 180.2097 14.13554165    15

NOAA10               137.50MHz
1 16969U          93290.82106501 0.00000122                          5042
2 16969  98.5150 302.1917 0012934 321.7010  38.3214 14.24837161    16

NOAA11               137.62MHz
1 19531U          93290.89200958 0.00000186                          4047
2 19531  99.1481 269.2092 0012760  92.8710 267.3840 14.12923624    11

NOAA12               137.50MHz
1 21263U          93290.85535603 0.00002015                          8098
2 21263  98.6440 318.6746 0012273 215.7022 144.3325 14.22324821    18

NOAA13               137.62MHz
1 22739U          93289.82911989 0.00008876                          2014
2 22739  98.9189 230.5509 0010809  86.6442 273.6316 14.10866171    15

MET2-19
1 20670U          93291.36526602 0.00000000                          7041
2 20670  82.5469  40.5451 0017260 103.8993 256.4088 13.84178196    11

MET2-20
1 20826U          93292.63746333 0.00000072                          7049
2 20826  82.5268 337.3746 0013989   7.5076 352.6291 13.83561622    15

MET2-21              137.85MHz
1 22782U          93289.84654493 0.00000030                          2034
2 22782  82.5486  39.2666 0022321 183.8424 176.2567 13.82986914    14

MET3-2
1 19336U          93291.49527421 0.00000043                          2033
2 19336  82.5404 134.7206 0017389 143.8562 216.3716 13.16961690    16

MET3-3               137.30MHz
1 20305U          93293.86376909 0.00000043                          9056
2 20305  82.5526  76.2083 0016064 158.9218 201.2569 13.16023577    18

MET3-4
1 21232U          93292.47380663 0.00000043                          6051
2 21232  82.5446 339.7727 0014438  70.5573 289.7107 13.16457107    16

MET3-5
1 21655U          93291.44033584 0.00000044                          6043
2 21655  82.5517 287.4690 0014163  81.8750 278.3976 13.16824002    19
```

The frequencies shown are the last frequencies the Russian satellites were heard on. NOAAs don't change. An explanation of the 2-line format for those who wish to convert or update their Amsat format files... In order, the blocks of data represent the following...

Line 1 : NORAD sat.number - Epoch date - Decay Rate - Checksum

Line 2 : NORAD sat.number - Inclination - Right Ascension - Eccentricity - Arg.of Perigee - Mean Anomaly - Mean Motion (8 decimal places) - Revolution No. - Checksum (1 digit)

(Note: The Eccentricity has a leading decimal place which is not shown but assumed.)

MEMBERS' LETTERS

[Any letters sent to the Editor, Make-up Editor or Committee are assumed to be available for publishing in the Newsletter, unless otherwise specified.]

A Light Hearted Look at a Serious Problem

Gentlemen,
I am addressing this to all as I am not sure who takes care of tales of woe, however I am one of the first of RIG members, but there was a short lapse when I had to sort out a problem like living when I had a plastic aorta fitted.

My newsletter. journals go back to No.1 and I have the complete set and I often browse through them, and think what a good buy they were, and still are.

I have since the Roneo 400 days had some sort of picture, I like to think of the Roneo as the steam engine version and later the Maplin as the impossible version. By the way, I still have it somewhere and would freely give it to a deserving case. I also have a surplus Amiga V1-1 - if you can find a home for it is also free, but it would have to be collected. The Amiga which I still miss as I could use some of the monochrome output for video tape recording, and I found that taping the picture was an ideal way of animating as it could be done in the best resolution, something which I cannot do on the PC with Prosat 2 which I run now. And by the way, I cannot print the upside down weather charts on my old KX-P1080

I think the Prosat 2 is the best thing since sliced bread and have no complaints. I still get up to 38db according to SNOISE on my 1.2M dish. I did have a blue period when I had a faulty ET4000 board which turned all the high resolution pictures blue, and as usual they first blamed the programme, but RIG were all set to help and were planning a rescue operation, but fortunately the firm finally agreed it was the board.

This leads me on to a plea for help. You see I am over the three score years and ten, and I have experienced a pretty hefty stroke, and not only that, but my polar orbiter antennae has suffered more than I. At least I can get about with the aid of a wheelchair and Bipod, and I have the use of one arm and hand, but I think that the pre-amp suffered a stroke of lightning which has affected its decibels.

Now the problem is a simple one. How can I lower the short pole with one arm, whilst sitting in a wheelchair. Has anyone any ideas? There is also the

problem of replacing the pre-amp or fitting a new crossed dipole and putting the whole lot back up again. The trouble could be that my home-made crossed dipole has given up and I could well afford a new one, but whilst on the subject of crossed dipoles, we all know there is a right and left hand but I have never seen a document anywhere to say if this is looking up or down. There is a difference.

It has been suggested that I employ an aerial fitter, but the bank manager would not give me a mortgage. I am sorry to say this but the disabled are often exploited. It was also suggested that I ask the Social Services, but would you believe that they said servicing satellite aerials was not on their list. Some blame the government, another suggested playing on my disability (no need to play, it's for real), so I guess those poor little orbiting orphans will have to do their very best and continue to orbit without my fatherly eye.

By the way I did not mention the fact that I am an orphan - well I must be as I have no other relatives who I could ask for assistance.

Unless there are some other bright idea's' from RIG members especially from any living close by. Excuse any spelling mistakes but the index finger on my left hand could never spell, and in no way would it write a begging letter, but I do urge you to think of those poor orphans and in the interests of humanity we should not desert them.

Now I ain't half gone on a bit as the whole lot could have been said in a couple of lines like this.

HELP! Is there anyone living near Harwhich who could help an old age pensioner to solve a problem with his crossed dipole.

RIG 34 just dropped through the letter box, and if I update I can print.

Yours Truly, G.S.Dutton 40 Grafton Rd., Harwich, Essex, CO1 3BD. Tel: 508962

Dear James

Although I have only been a member a short while I feel I should express my thanks to James, Henry, Dave and Mike for the help I have been given in setting up my ProScan/ProSat2 system and for the excellence of the Journal, as we must now call it.

After a period when I could not use colour I have fitted a new video card and can experience the "coming to life" of my images, such a change from monotonous monochrome. It also gave me an insight into the range of prices for cards, Henry will know what I mean! I did not dare tell anyone I was going to install the turnstile in the loft of my bungalow because I thought I

would be told to forget the idea. I didn't fancy its chances outside with the winds we get here on the West coast of Wales. However, I am high up, with a clear outlook and the results have been excellent. The fitting of the RIG/Timestep VHF preamp has helped to greatly increase the duration of the usable signal to what I think is the maximum possible.

The one thing which disappoints me is the manual, or as James described it "the poorness of the documentation". For my own edification I am starting to rewrite it and would be pleased to hear from anyone who has any comments which might help or who has their own particular methods of using ProSat2, please write or phone 0646 695141. As it stands it does little to help one exploit the full potential of an excellent product. It always amazes me that there is a need for so many books to help people understand software but I suppose it is because program designers are never the best people to explain their product in writing.

I have now started using a modem and although I am not always successful with the RIG BB due to noise on the line to Henry's local exchange, I have now got the Timestep BB down to a fine art. I can download the TWOLINE (NASA) elements in a total elapsed time of 87 seconds from connection to disconnection, which I don't think is bad!

So far I have concentrated on NOAA/METEOR but I keep thinking about METEOSAT and wondering if it is within my reach ????

Kind Regards, Peter Finn, 187 Steynton Road, Milford Haven, Dyfed SA73 1AL

Dear James,

First of all can I reiterate my thanks to all those who worked hard to make such a success of the residential weekend conference. I found it highly educational, enjoyable and entertaining.

In talking to people there, it appeared that not everyone was aware of the METFAX service offered by the Meteorological Office. The general concept is that if you have a fax machine with POLL RECEIVE mode, then you can call the Met Office on one of a number of premium rate numbers (48p per minute peak rate, 36p off peak), and by pressing the appropriate buttons you can receive the requested fax. For example:

0336 400 480 Index Page	2 mins
0336 400 481 Shipping forecast	2.5 mins
0336 400 484 Surface Pressure Chart	3 mins
0336 400 485 Surface Pressure Forecast	3 mins
0336 400 487 Map of latest reports	2.5 mins
0336 400 439 'Meteosat Image'	6.5 mins

As I don't have access to a fax machine any more, I cannot comment further except that I saw the service demonstrated at a recent educational exhibition where it looked impressive (and expensive!) Not having a fax also means I can't help you with 'poll receive' mode either, but your fax manual might. If anyone has used this perhaps they could let the editor know.

Best wishes, Andy Middlethwaite,
15 Crabtree Avenue, Disley, Stockport, Cheshire, SK12 2DD

HELP!

I am having difficulty locating a source of the Harris I.C. HD6409/883 as used in various RIG articles by Marciano Righini. Can any member please help? I have tried the usual sources of RS, STC, Farnell etc, but with no success.

John Morris 132 Markland Hill, Heaton, Bolton BL1 5EJ Tel: (0204) 840629

[Since receiving this letter John tells us that he has been given the name of a supplier for the I.C. They can be obtained from: Macro-Marketing Ltd., Burnham Lane, Slough, SL1 6LN. Tel: 0628 604383, Fax: 0628 666873. Price £20.21 + VAT. Ordering information for Dual in-line Plastic package is type HD3-6409-9 CMOS Manchester Encoder/Decoder.]

ERRATA...

In the last issue of the Journal (in a letter from Graham Smith) we attributed the wrong callsign to Trevor Stockill. His correct call is G4GPQ.

The Editors would like to express their thanks to...

Peter Walelin and Trevor Smithers
for the excellent colour pictures printed in this issue

also Mark Pepper for processing and screening the monochrome pictures in this issue.

BULLETIN BOARDS:

There are now operating, 24 hours a day, three Bulletin Boards that you can use to download Keplers and get other information regarding latest developments in the Weather Sat scene; such as which Russian satellites are currently operating, etc. The RIG BBS also has Shareware, etc. which can be downloaded. You can also leave messages on some BBS's for the operators. There is no charge for these services, just the cost of your telephone call. The Keplers files on the RIG an Timestep BBSs are updated every week and are in Amsat and 2-line format; or give the Dartcom BBS a try.

The RIG BBS is on 0945 85666.

The Timestep BBS is on 0440 820002.

The Dartcom BBS is on 0822 88249.

The protocol is the normal standard, 8 bit, no parity, 1 stop bit.

A quarterly publication for hardware, software and applications of WEFAX, APT, VAS, HRPT and GOESTAP.

WeatherSat Ink

The Environmental
Satellite Applications Journal

4821 Jessie Drive, Apex, NC 27502, USA

$15 US per year $20 all others, US funds
MasterCard/Visa OK with $1 surcharge

RIG AT RALLIES

For those members who are not Radio Amateurs, a brief explanation of the term "Rally". These are events normally organised by local Radio Amateur clubs and societies, and are held in Schools, Halls, or just outside town in Marquees in local fields. There is normally parking space provided and a small entrance fee is normally charged.

They consist of trestle tables containing new and used equipment and components, from traders in the electronics and computer field, often at knock down prices. (Many resemble the familiar Car Boot Sale.)

There are also displays and demonstrations by radio related societies and organisations (such as RIG). They normally start at 10.00 or 10.30am and fizzle out at around 4.00pm. They are normally signposted from the town in question by small signs attached to road signs, etc. reading "Radio Rally", "Rally", or the initials of the society, such as "ERAS", etc.

If all else fails, look for a stream of cars sprouting aerials on their roofs, and follow them.

IMPORTANT... If you visit a Rally in order to purchase RIG goods please give Henry a ring a couple of days before, so that he can put them on one side for you, as only small quantities are normally taken.

We hope to attend the following again next year...

February 20	(RIG AGM) Sandown Racecourse, Esher, Surrey
March 12-13	Picketts Lock, Demonton, North London (off M25)
May 1	BATC, Ryton-on-Dunsmore, Coventry (new venue)
May	NEC Birmingham Exhibition Centre
June	Springfields, Spalding, Lincolnshire
June 12	Elvaston Castle, Derbyshire
June	Longleat, in grounds of Wildlife park
July	York, Racecourse
August	Woburn Abbey, Bedfordshire, in the grounds
September	Lincoln, Showground
September	BARTG, Sandown Racecourse, Esher, Surrey
September	Peterborough, East of England Showground
October	Leicester, in the Granby Halls (2 days)

We are always pleased to see volunteer members at these rallies, especially those who live local to the event, who can help out on the RIG stand for a short while, and give the regulars a break during the day.

RIG HELPLINES

General Enquiries Meteosat information NOAA information Supplier Complaints	John Tellick	081 390 3315

A copy of the Group Rules can also be obtained from John Tellick

Russian, Chinese satellite information/status	Peter Wakelin	0344 23200

Schools Education Co-ordinator		John Tellick	081 390 3315
Schools/	John Murray	Torquay	0803 217754
Educational Enquiries	Frank Bell	Godalming	0483 416897
	Tom Walter	Reading	0734 871330
	Bob Coombes	Haslemere	0428 642930
	John Din	Bristol	0454 773387
	Alan Wright	Norwich	0603 713449
Framestore Technical Support	Mike Coombs (7.30pm-9.30pm)		0530 243494

RIG MICRO SPECIALISTS:

PC and Printer Problems	Mark Pepper (office hours)	0494 471111 (Ext.2133)
BBC Micro	Enquire via John Tellick	081 390 3315
Commodore Amiga	Chris Pretty	0420 82752
Archimedes	Tom Walter	0734 871330
HRPT	Peter Wakelin	0344 23200
PDUS	James Brown (Not available on Sundays)	0656 782632

NOTE: We are very grateful to the above members for offering their services to the Helpline. Please do not abuse the service by ringing them for queries other than those listed against their names.

REMOTE IMAGING GROUP

RIG SUBSCRIPTION - NEW MEMBER

If you would like to become a member and receive the Journal, photocopy this page, complete the form below, sign the declaration and send it to...

RIG SUB, PO BOX 142, Rickmansworth, Herts, WD3 4RQ, ENGLAND

The subscription rates for 1993 are...

UK membership	£10.00
Europe EC	£12.00
Europe outside EC	£12.00
Outside Europe	£14.00

Name ..... Call Sign (if any) .....

Address .....

.....

..... Post Code .....

Country ..... Telephone No. .....

Are you receiving:
Polar Orbiting Weather Satellites ..... Geostationary Weather Satellites .....

Do you require Back issues? (see Rig Shop Corner) .....

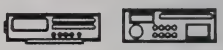
Amount Enclosed £.....

Are you willing to have your name/address made known to members in your area? YES / NO. *(Delete as applicable)*

DECLARATION: I do NOT object to the Remote Imaging Group holding my Membership details on a computer.

Signed ..... Date .....

RIG SHOP CORNER



*** ALL PRODUCTS FOR SALE TO RIG MEMBERS ONLY ***
*** FOR THEIR OWN PERSONAL USE ***
*** NOT FOR SELLING-ON ***

All prices shown include post and packing except where marked

Receiving Equipment	UK/EC Price	Overseas Price
RIG DARTCOM Meteosat Downconverter. Assembled and tested module in tin plate box	£148.00	£126.00
Complete, assembled and mounted in weather-proof box.	£185.00	£158.00
RIG DARTCOM VHF Scanning Receiver. Assembled and tested module, with LED channel number display.	£130.00	£110.00
As above, but with LCD frequency read-out instead of LED channel number display. *Both the above items are modules and require a box, together with several components, switches, etc.*	£171.00	£145.00
RIG TIMESTEP PROscan Receiver. *See advert on page 70.*	£191.00	£163.00 *Special Rally Price £185.00*
RIG VHF Preamp. Includes a bandpass filter and is ideal for mast-head mounting. Assembled/tested module; needs boxing.	£17.00	£15.00
RIG TIMESTEP VHF Preamp Built and tested, in diecast box, 12vdc coax-fed	£24.00	£20.00
RIG 1695MHz Low Noise Amplifier kit. *Experienced constructors only.*	£29.00	£25.00
Computer Software/Hardware		
RIG TIMESTEP PROsat II, IBM/PC Compatible System. *See main advertisement.*	£100.00	£90.00 *Special Rally Price £98.00*
Antenna systems		
RIG CROSSED DIPOLES A Turnstile type design, in kit form *(available in UK only)* incl. P&P		£26.00 *Special Rally Price £20.00*

DISHES *(Available in UK only - Prices do NOT include P&P, see below)*

1.0 Metre (dish only), nearly new condition	£25.00
Dish Feeds	£25.00

The above dish prices are for collection from the Chairman, or by prior arrangement at Rallies or Exhibitions. (Please ring the Chairman for details of availability of dishes and feeds).

RIG Binders

Available by post from Gordon Fleming, 168 Bythway, Welwyn Garden City, Herts. AL8 1DU. UK Price £4.00 each, EC/European Price £4.50, Outside Europe Price £5.00. Cheques to *"REMOTE IMAGING GROUP"* please.

Back Issues of RIG Newsletters

		Rally Price	UK Price	EC/Europe Price	Outside Europe Price
RIG 8-11	1987	£4.00	£5.00	£6.00	£7.00
RIG 12-15	1988	£4.00	£5.00	£6.00	£7.00
RIG 16-19	1989	£4.00	£5.00	£6.00	£7.00
RIG 20-23	1990	£5.00	£6.00	£7.00	£8.00
RIG 24-27	1991	£5.00	£6.00	£7.00	£8.00
RIG 28-31	1992	£5.00	£6.00	£7.00	£8.00

Note: Prices quoted are for a set of four, including Post and Packing.

RIG 1-7 are currently out of print. Owing to depletion of some issues, photocopies may be supplied. Individual issues are no longer available (hardship cases excepted).

Ordering Information

All items are available from the Chairman, Henry Neale (except where marked) and include return by UK 1st class mail (except dishes and Newsletters). Euro overseas sent via Airmail printed paper rate.

UK VAT is now applicable on sales to the following EC countries - France, Germany, Belgium, Portugal, Spain, Republic of Ireland, Denmark, Italy, Luxembourg, Netherlands, United Kingdom (including Isle of Man). Members in these countries should use UK/EC price when ordering. EC members who are registered for VAT must forward their VAT registration No. to the Treasurer to enable them to receive VAT exempt goods.

As UK/EC prices now include VAT where applicable; receipts will be issued upon request. Remote Imaging Group VAT Registration No. 594 7483 83.
Channel Isles: divide by 1.175 to remove VAT content.

UK members, By Cheque or Postal Order. **Overseas members,** Pay by Bank Draft (drawn on a UK London-based bank) or Eurocheque(s). (Payments to a Maximum of £100.00 in any one Eurocheque). No local currency please.
All cheques made payable to *"REMOTE IMAGING GROUP"*.

* * * \

UPGRADES...

PC-SAT3 to PCwSatIII Update disk. Dec. 1992, as mentioned in RIG24, incl. MET3-4. £3.00 handling charge, state disk size required.

PROSAT-II Update disk, July 1993, all new features, see main advertisement, £15.00 including P&P. 3.5" disks sent unless advised to the contrary.

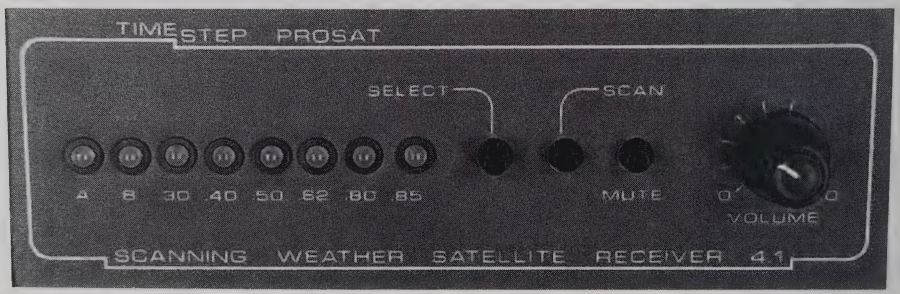
SNOISE, Signal to noise measuring program for Meteosat (for ProsatII system only) Send disk and return S.A.E.

TIMESTEP HRPT DEMO DISK, 1.4Mb. £3.00 handling charge.

OFS WEFAX DEMO DISK, 1.4Mb. £3.00 handling charge.

All upgrades available only from the Chairman.

RIG-TIMESTEP PROscan POLAR RECEIVER



A professionally made scanning receiver covering all NOAA and Soviet Polar Orbiting Satellites. The frequency can be readily seen via an LED on the front panel and unwanted channels can be locked out. It is designed with a lot of internal filtering, making it ideal for locations that suffer from Pager problems. It is resistant to pager interference at 1 to 2 miles (where the field strength is at maximum), and also carries an unconditional money back guarantee. *See RIG32 page 88 for further details.*

For the latest prices of the above equipment see Rig Shop Corner

RIG - TIMESTEP PROSAT II

New Features

New purchasers will be pleased with a price reduction to £98.00. Remember the package already includes latitude and longitude gridding on NOAA and now Meteor, direct temperature calibration on NOAA, 100 frame stand alone animation, full satellite data capture and save regardless of video card type.

.BMP Windows export... This will export any screen, in any zoom, in any contrast stretch and or colour in to a .BMP file which is the default for all Windows applications. The Paintbrush program will print in 256 colour and add annotation, even though it won't colour edit in 256 colour mode. All the Windows supported printers can be accessed from Paintbrush.

NOAA Schedule... This allows you to pre-set reception of up to 20 different polar orbiting satellite passes.

Meteor Gridding... The impossible at last ! We can't guarantee this, but our tests indicate that we have cracked the problem of latitude and longitude gridding of Meteor images.

LaserJet 4 600DPI... There is a new driver that allows 32 greyscale printing of images using the new HP LaserJet 4 printer.

Dot Matrix printers... Both 9 and 24 pin dot matrix printers are now fully supported.

Auto Colour... For visible light images from Meteosat, we now have a really clever auto colour function. Just click on the button and false colour will be calculated and applied. Has to be seen to be believed !

Instant Contrast... Markers can be put on the colour/contrast scale by double clicking the mouse. They can be dragged up and down the scale using the mouse, giving instant contrast adjustment.

Annotation... Both the NOAA and Geostationary programs now have built in annotation facilities. This allows marking of features such as cities and weather phenomena. It is switchable on or off and does not change size as zoom ratios are used.

There have been some significant upgrades to PROsat II for 1993. A new set of discs and a new manual is available from Henry for £15.00 for previous purchasers. The upgrade reflects the needs and suggestions of RIG members.

Timestep

Meteosat Meteosat is probably the best place to start. It sends images constantly. You could by one of our ready to go systems, or you can buy the parts separately. Remember you do not need a NOAA receiver if you use our Meteosat Receiver. This will free your NOAA system to look for the Soviet polar orbiters, something every satellite enthusiast should be doing !

	Britain	EC Countries	USA	World
* 1.0M pole mount dish and feed	£199.00	£255.00	n/a	n/a
* Meteosat P-HEMT pre-amplifier	£255.00	£265.00	$450.00	£240.00
* 20M cable	£ 20.00	£ 23.00	$ 70.00	£ 22.00
* Meteosat receiver	£255.00	£265.00	$450.00	£240.00
* PROsat II IV/MegaNOAA card	£199.00	£225.00	$349.00	£185.00
* PROSAT connecting cable	£ 15.00	£ 20.00	$ 30.00	£ 18.00
Colour Animate	£199.00	£225.00	call	£185.00
Dish feed (coffee can type)	£ 49.00	£ 59.00	$ 99.00	£ 66.00

* **Complete ready to go Meteosat system (less computer) £940.00 inc This is all you need to start receiving weather images every 4 minutes 24 hours a day !**

NOAA The scanning receiver is immune to interference and covers all known satellites including the complete Soviet series.

* Crossed dipole antenna	£ 59.00	£ 69.00	$ 99.00	n/a
* NOAA pre-amplifier	£ 42.00	£ 52.00	$ 65.00	£ 50.00
* 40M cable	£ 40.00	£ 46.00	$140.00	£ 55.00
* PROscan receiver	£299.00	£325.00	$499.00	£280.00
PROsat II IV/MegaNOAA card	£199.00	£225.00	$349.00	£185.00
* TRACK II Prediction Software	£ 49.00	£ 55.00	$ 99.00	£56.00

* These items are needed to upgrade the Meteosat system above.

Image Processing

Multispectral View II	£199.00	£225.00	$349.00	£185.00
24 bit video card	£ 99.95	n/a	n/a	n/a
Satview CD ROM	£ 39.95	£ 45.00	n/a	£ 35.00

Meteosat PDUS

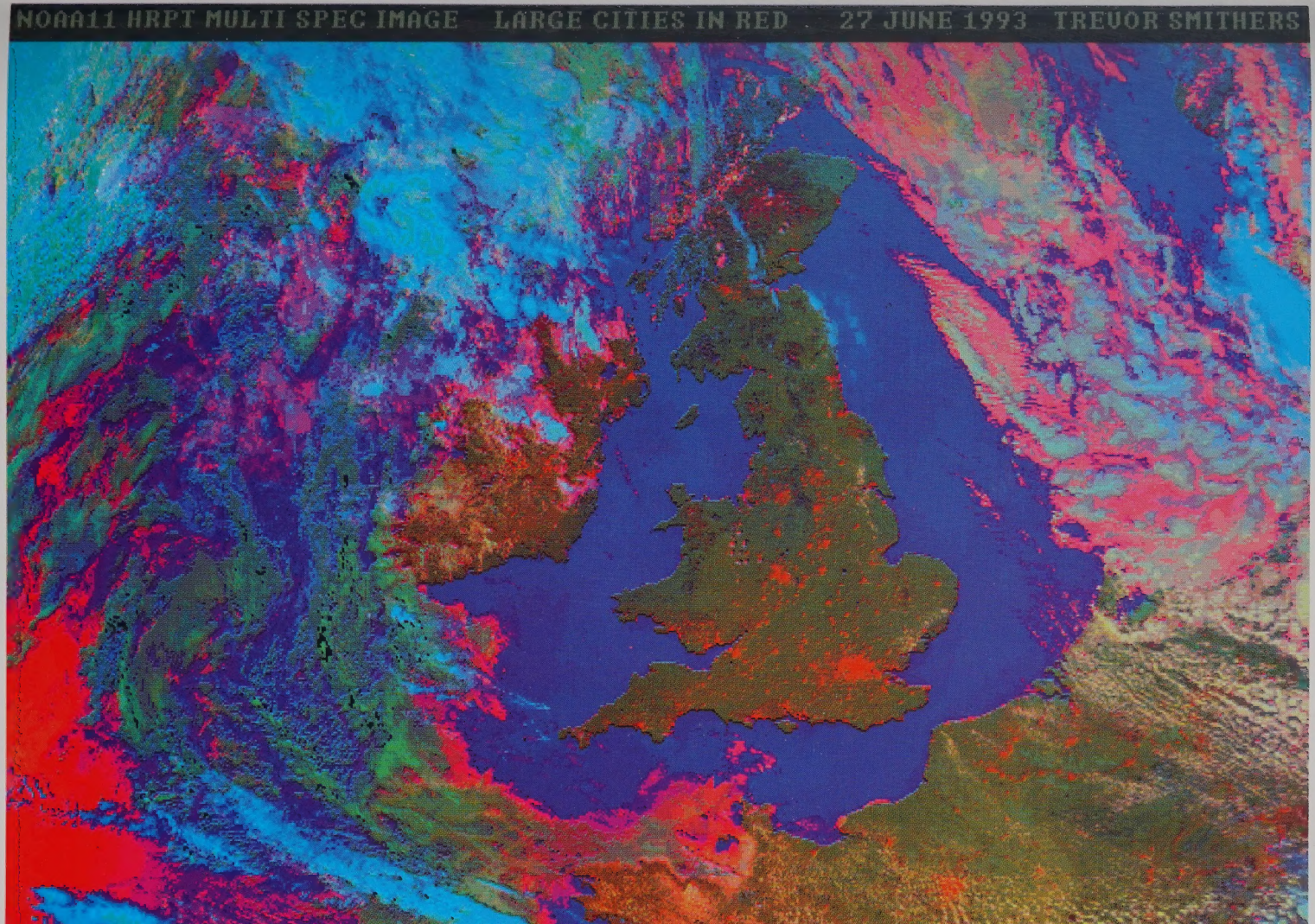
	UK price (call for export)
1.6M dish (inc. patio mount and dish feed)	£399.00
Dish feed (included with the dish above)	£ 49.00
P-HEMP Preamplifier	£255.00
20M cable	£ 20.00
Extra 20M cable and line amplifier	£ 70.00
2 channel PDUS receiver	£699.00
PDUS PC/AT card and full software	£499.00

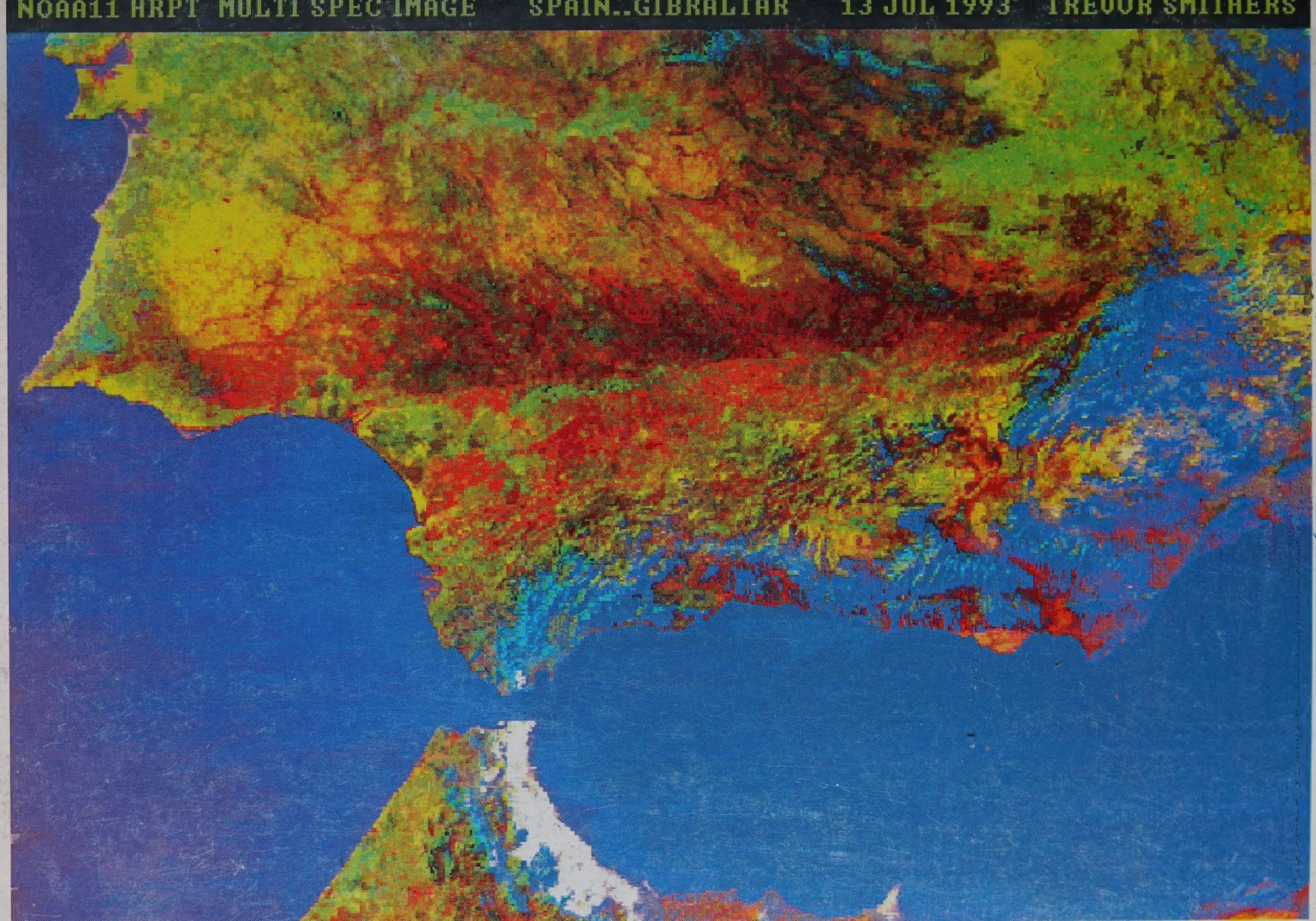
NOAA HRPT

90cm dish, dual feed, all metal work and galvanised ground stand	£299.00
90 degree combiner and cables	£125.00
Yaesu R5400 Az-El rotator	£469.00
25M control cables and heavy duty connectors pre-fitted must be ordered at the same time as the Az-El rotator	£125.00
Tracking card and software for automatic operation (needs separate computer) available early 94	£299.00
P-HEMT Preamplifier	£255.00
20M signal cable	£ 20.00
Extra 20M signal cable and line amplifier	£ 70.00
6 channel (5 fitted) HRPT receiver	£699.00
HRPT PC/AT card and full software	£499.00
Dish feed (dual polarity, for your own dish))	£ 59.00

All prices include :- VAT at 17.5% and carriage in Britain VAT and Air carriage to EC countries Duty but not sales tax or carriage in N America (carriage is less than $10.00 and shipped from Boston Mass) Air carriage (but not duty or tax) to other destinations.

Timestep PO Box 2001 Newmarket CB8 8XB
Tel. 0440 820040 Fax. 0440 820281


NOAA11 HRPT MULTI SPEC IMAGE LARGE CITIES IN RED . 27 JUNE 1993 TREVOR SMITHERS


NOAA11 ARPT MULTI SPEC IMAGE SPAIN..GIBRALTAR 13 JUL 1993 TREVOR SMITHERS